ORDER NO. VRD-8404-503

Service Manual

General Description
Adjustment Procedures
Block/Schematic Diagrams
Exproded Views/Parts List

Panasonic VHS

Portable Video Cassette Recorder

NV-180 E EG B

AC Adaptor

VW-A18 E B

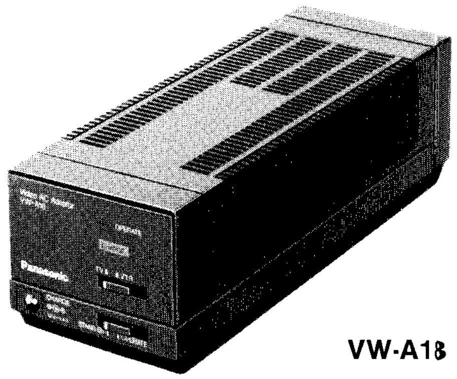
Wired Remote Controller

VW-R17E

Plug In AC Adaptor

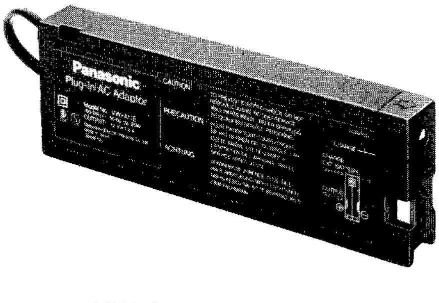
VW-A11 E B

NV-180



VW-A18

VW-R17



VW-A11

Panasonic

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

INTRODUCTION

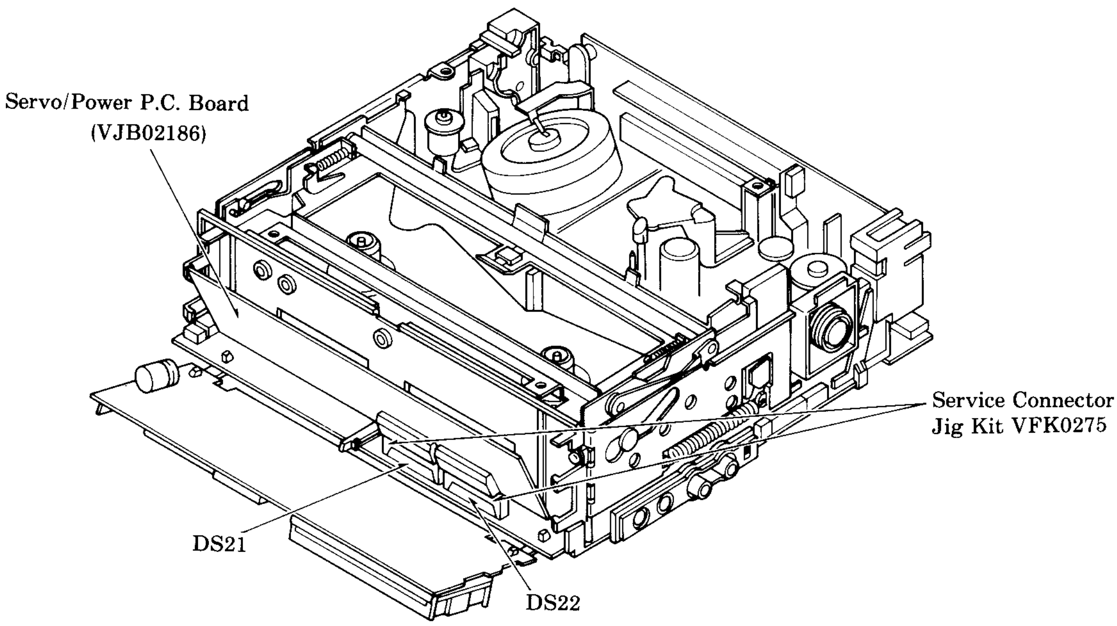
By implementing a large number of latest technological developments from a wide range of diverse fields, Panasonic succeeded in making this new portable VTR NV-180 a standard in terms of low weight, compact dimensions and overall operation.
This service manual contains these technical information which will allow service technicians to understand and service the Panasonic Portable PAL VHS Video Tape Recorder NV-180, AC Adaptor VW-A18, Plug in AC Adaptor VW-A11 and wired Remote Controller VW-R17. The new NV-180 features a new 2-double-video-head system that allows Super Still, Super Still Advance playback without jitter and distortion and Super Fine Slow Motion with 1/5th of normal playback speed which can even be adjusted between 1/3rd and 1/25th via the remote control unit. Cue & Review, insert, editing, audio dubbing, tape time remaining indicator and Multi-Function Display.
These features in addition to the basic PAL VHS format make the unit an ideal one for your culture and entertainment.

Technical Information

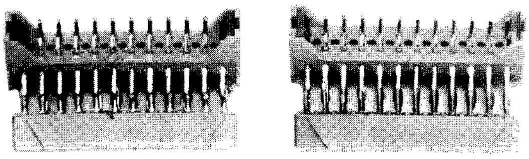
Subject: Service Connector JIG KIT (VFK0275)

We are pleased to inform you that we shall soon introduce the new portable video cassette recorder NV-180 in the market. Regarding this model, this service connector Jig Kit is necessary to check the Servo/Power P.C. board (VJB02186). Therefore, please place an order for this Jig Kit (VFK0275), and distribute this Jig Kit to your local branches and dealers.

* **Procedure for use**



Connection of Jig Kit (VFK0275)



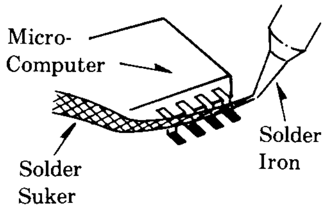
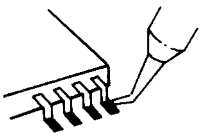
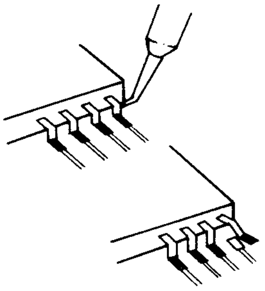
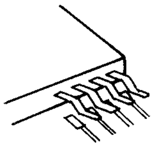
Service Connector Jig Kit (VFK0275)

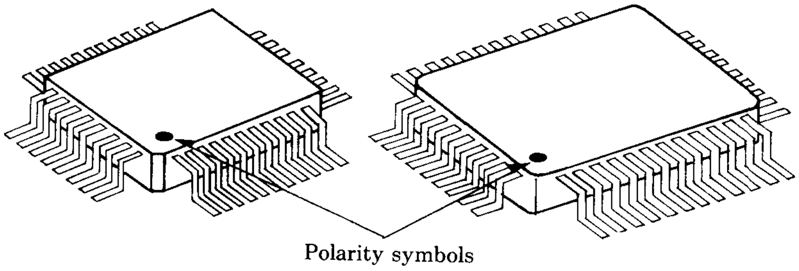
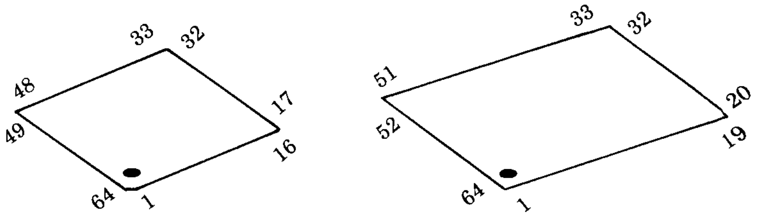
1. Remove the Servo/Power P.C. board (VJB02186) from Main P.C. board (VJB02184).
2. Connect the Service Connector Jig Kit (VFK0275) to connector DS21 and DS22 of Main P.C. board.
3. Reconnect the Servo/Power P.C. board (VJB02186) to Service Connector Jig Kit (VFK0275)

By using this connector Jig Kit, Servo/Power P.C. board is slanted by 45 degrees.

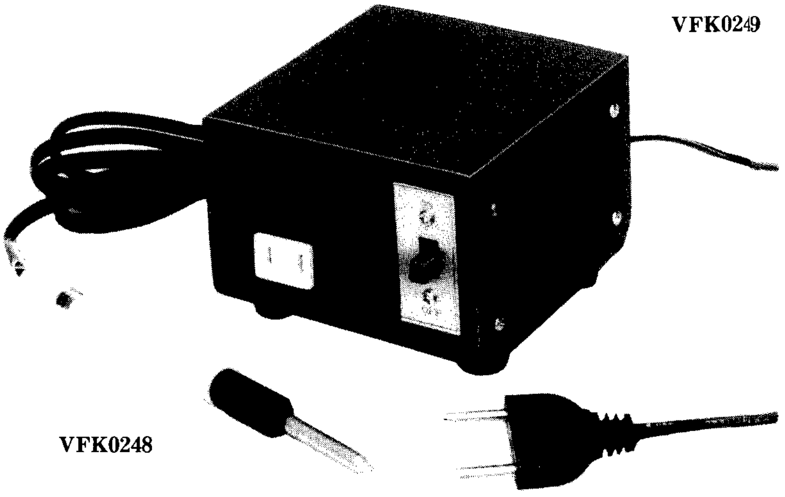
Subject: Method of replacing the FLAT Package-type Micro-computer

The flat package-type micro-computer has the different form from any of the conventional micro-computers because of smaller size and lighter weight newly provided. The replacing method is described below, which will help you to effectively perform services when replacing it.

Procedures in replacing the flat package-type micro-computer		**Precautions**
Removal		
Before removing the micro-computer from the P.C. board, absorb the solders deposited on the pins using a clean solder sucker shown in the drawing so that the residual solder will be minimized.		Use the solder iron (model VFK0248) specified for use with chip parts. Make sure to connect a 240V-AC transformer (model VFK0249) to the solder iron which is designed for use with 100V of the AC voltage.
Melt the solder on each pin (an electrode) with the top-end of the solder iron.		To prevent stripping of the printed foil, do not place the solder iron on any pin for a long while.
While the solder is still melted, pull up each pin using the top-end of the solder iron and remove the pin from the foil.		Pull up the pins as fast as possible while the solder is being melted. If the solder is solid, the printed foil may either drop off or be cut.
Repeat these operations in sequentially removing each pin from the foil.		

Installation of a new micro-computer	
First, evenly apply the solder element to the foil surface where the pins must be soldered.	 Polarity symbols  33 32 48 17 49 16 64 1 33 32 51 20 52 19 64 1 Correctly align the positions of these polarity symbols with the coner-cut portion as well as the polarity symbol on the printed circuit board.
Properly determine the positions of the foil and pins by correctly aligning the polarity symbols, then secure the micro-computer in position.	
Solder all pins to properly connect to the foil.	

SPECIFICATIONS


VFK0249
VFK0248

Solder Iron: VFK0248

Rate: 100V—15W

Insulation
Resistance: 100MΩ

Max. Temp.: 400°C

Transformer: VFK0249

INPUT: 240V AC

OUTPUT: 100V AC
0.3A

SECTION 1
GENERAL DESCRIPTION

1-1. FEATURES

❶ **Compact, Lightweight and Portable**
This portable VHS VTR is tremendously versatile in recording with a camera, and very light in weight—only 2.3kg excluding a battery.

❷ **Multi-Function Display**
Whenever an operation button is pressed, the activated function is immediately indicated on this easy-to-see Multi-Function Display. It shows you at a glance, in what operation mode the VTR is.

❸ **Three-Way Power Operation**
You can operate the VTR and camera by using three power sources:
Battery pack, AC adaptor, or car battery cord (all optional).

❹ **Multi-Motion Playback**
In addition to normal playback, you can quickly review and cue recorded tapes as well as enjoy super still, super still advance, and super fine slow-motion viewing.

❺ **Insert Editing**
The Insert Editing allows you to insert new pictures onto a pre-recorded tape. To complete tape editing you can add the sound with the audio dubbing function.

1-2. CONTROLS & COMPONENTS

❶ **Reset Button**
Push the reset button to reset the Counter of Multi-Function Display to "0000".

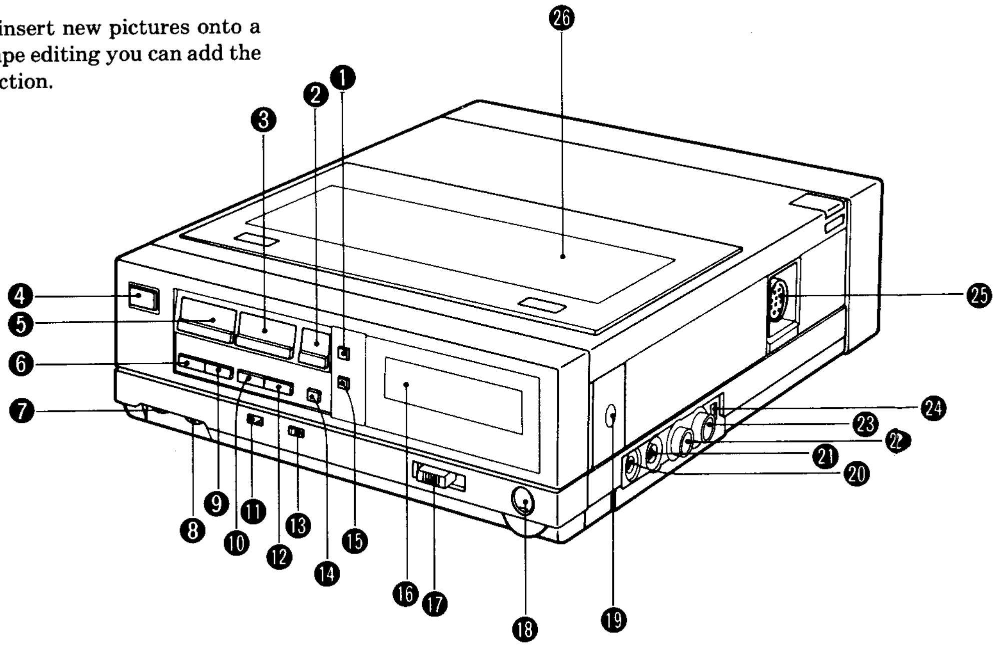
❷ **Record Button**
Push together with Play Button to start recording.

❸ **Play Button**
Push to play back a recorded tape.

❹ **Eject Button**
Press this button to remove the cassette.

❺ **Stop Button**
Push to stop the tape.

❻ **Pause/Still Button**
Push to temporarily stop the tape during recording in order to avoid recording unwanted material, or to view a paused picture during playback. Push again to release the tape from pause.


❶
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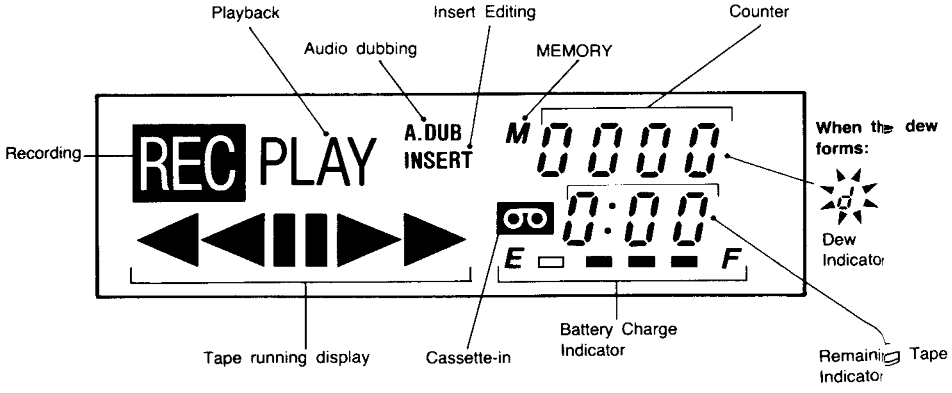
⓰ **Multi-Function Display**


Playback
Audio dubbing
Insert Editing
MEMORY
Counter
Recording
REC
PLAY
A.DUB
INSERT
M
0000
0:00
E
F
When the dew forms:
Dew Indicato
Tape running display
Cassette-in
Battery Charge Indicator
Remaining Tape Indicato

⑦ **Tracking Control**

Noise Picture

Tape recorded on another machine show noise or a streaky playback picture, rotate this control slowly in either direction until the picture is clear. The control should normally be kept in the "FIX" position.

⑧ **Slow Tracking Control**
When noise appears during multi-motion playback (still-frame, super still advance, or super fine slow-motion), activate the slow playback mode and turn the Slow Tracking Control clockwise or counterclockwise to reduce the noise.

- During multi-motion playback using tapes recorded on other VTR the Slow Tracking Control may not significantly reduce noise.
- Multi-motion playback may cause some distortion in the upper parts of the picture, but this is normal and does not indicate a trouble.
- When the picture rolls vertically, adjust the TV's vertical hold control.

⑨ **Slow Button**
Press SLOW Button during playback, and the super fine slow picture will be played back at 1/5 that of normal playback speed.
For normal playback, press PLAY Button again. If super fine slow-motion playback continues for more than 10 minutes, the VTR will automatically stop.

⑩ **Rewind/Review Button**
Push to rewind the tape.
When this button is pressed during playback, the picture can be scanned in reverse at 7 times normal speed. Review will continue as long as the button is depressed.

⑪ **Cassette Selector**
To see the remaining tape time in the Multi-Function Display as follows.
"E240"......For NV-E240 cassette tape
"~E180"...For all other cassette tape

⑫ **Fast Forward/Cue Button**
Push to fast-forward wind the tape.
When this button is pressed during playback, the picture can be scanned will play back at 7 times normal speed. Cueing will continue as long as the button is depressed.

⑬ **Camera Select Switch**
When camera recording, this switch must be set to REMOTE. Set it to NORMAL at the other cases.

⑭ **Audio Dubbing Button**
When this button is pressed simultaneously with the Play Button during playback, sound from another source can be recorded on the tape in place of the original sound. (The original sound will be erased.)

⑮ **Memory Button**
When this switch is turned on, the tape will automatically stop rewinding just the portion where the Tape Counter was previously set to "0000".

- The tape will not stop at this point during review playback.

⑯ **Multi-Function Display**

⑰ **VTR ON/OFF Switch**
This switch is used to turn the VTR deck on and off.

⑱ **Remote Control Socket**
For connecting the Wired Remote Control Unit.

⑲ **Shoulder Strap Holder**
Connect the Sholder Strap to the Holder.

⑳ **Microphone Input Socket**
For Connecting an Audio Input Attenuator (included). This is useful for recording and audio dubbing.

㉑ **Audio Output Socket**
For connecting an audio cable of a TV monitor, a component audio system, or another VTR.

㉒ **Video Output Socket**
For connection to a TV monitor or another Video Cassette Recorder. Not used with an ordinary TV.

㉓ **Video Input Socket**
For connecting the video cable of a video camera or an output video signal of another VTR.

㉔ **RF OUT/LIGHT Switch**
When using the Battery Pack or the Plug-in AC Adaptor, set this switch to "ON" to monitor through the RF OUT Socket during recording. If set to "ON", the Multi-Function Display is lit.

㉕ **Camera Input Socket**
For connection of a portable video camera.

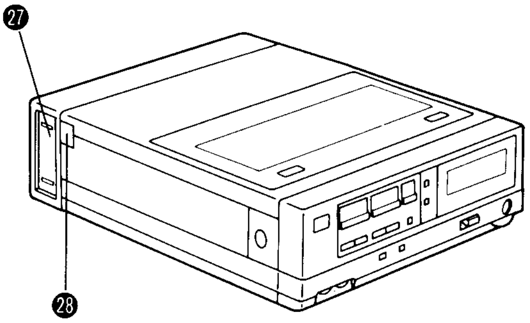
㉖ **Cassette Holder**

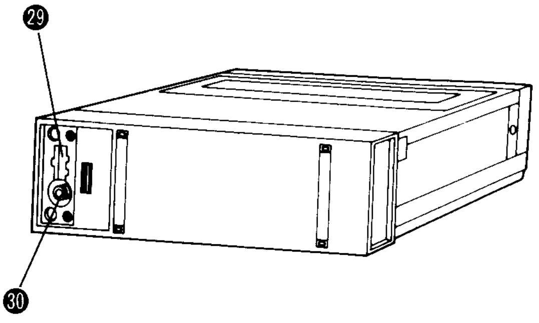
㉗ **Battery Compartment**

㉘ **Battery Eject Button**

㉙ **Adaptor Socket**

㉚ **RF Output Socket**





SECTION 2
ADJUSTMENT PROCEDURES

2-1. MECHANICAL ADJUSTMENT PROCEDURES

The model NV-180 uses the FT Mechanical Chassis. Therefore, please refer to the Service Manual FT chassis (Order No. VRD-8405-529) for main mechanical adjustments.

2-1-1. DISASSEMBLY FLOWCHART

This flowchart indicates disassembly steps of the cabinet parts and the P.C. Boards in order to find the items necessary for servicing.
When reassembling, perform the steps in the reverse order.
The bottom plate can be removed individually.

Note:

1. When removing the cabinet, work with care so as not to break the locking portions.

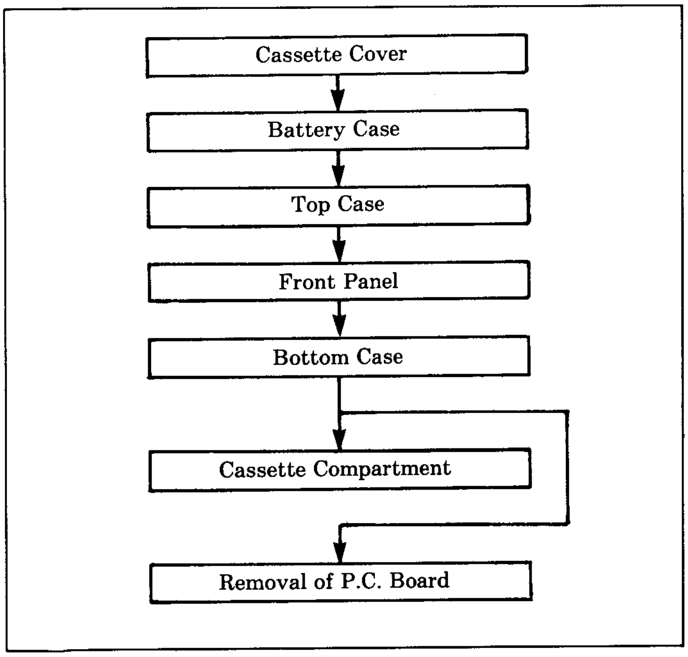

Cassette Cover
Battery Case
Top Case
Front Panel
Bottom Case
Cassette Compartment
Removal of P.C. Board

Fig. 1 Disassembly Flowchart

2-1-2. DISASSEMBLY METHOD

Notes:

a. Place the cloth or any other soft materials under the P.C. Boards or deck for preventing them being damaged while servicing.
b. When reinstalling, ensure the connectors are connected and any electrical components are not damaged.
c. Do not supply power to the deck during working except removal of the cassette cover.

1. **Removal of the Cassette Cover**

   Supply power to the deck and turn it on. Then press the EJECT button to raise the cassette up holder.
   Remove 2 rubber covers and 2 screws (A). Then carefully lift and pivot the front portion to remove.
   Pay attention so as not to damage the locking portions (B).

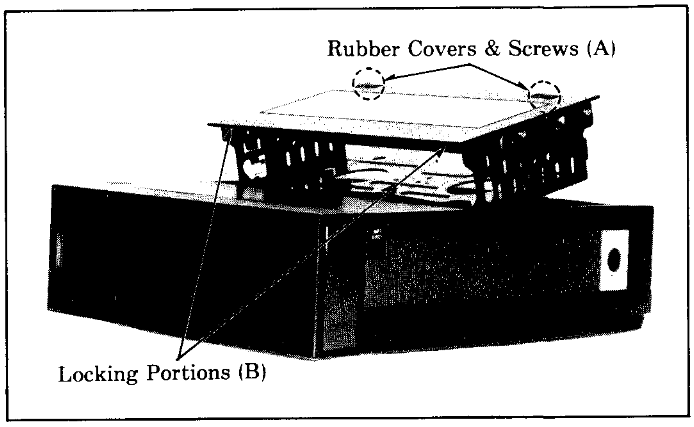

Rubber Covers & Screws (A)
Locking Portions (B)

Fig. 2 Removal of the Cassette Cover

Note:
When reinstalling, first lock the locking portions (B).

2. **Removal of Battery Case**
   (1) First confirm that the battery is not inside the battery compartment.
   If it is, remove the battery.
   (2) Place the deck upside down so the bottom case faces upward.
   (3) Remove 2 screws (C), and hold both right and left ends of the battery case. Then carefully lift and pivot the top portion of the battery case.

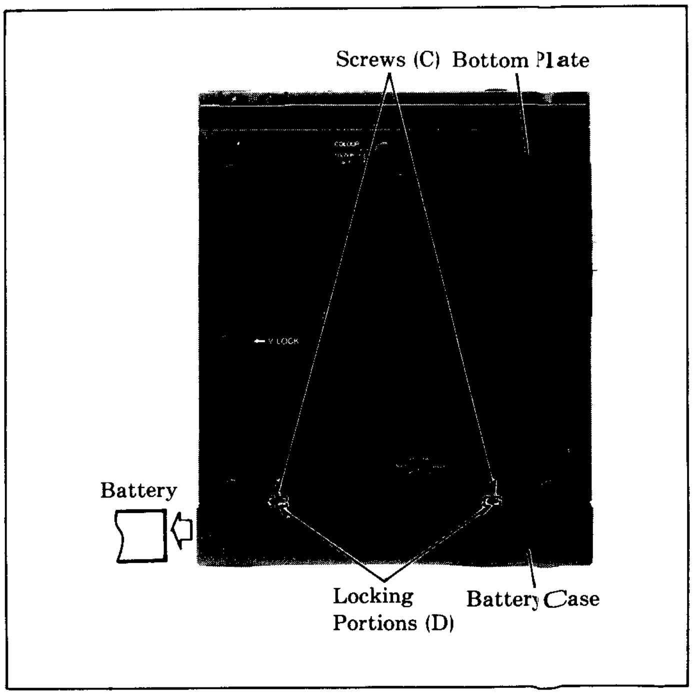

Screws (C)
Bottom Plate
Battery
Locking Portions (D)
Battery Case

Fig. 3 Removal of the Battery

Note:
When reinstalling, first insert the locking portions (D) into the slot of the top case.

3. Removal of the Top Case

(1) Remove the 2 screws (E) on the front panel.

(2) Remove the 4 screws (F) on the top case. Then remove the top case by lifting the rear portion and pay attention so as not to damage the locking portions (G).

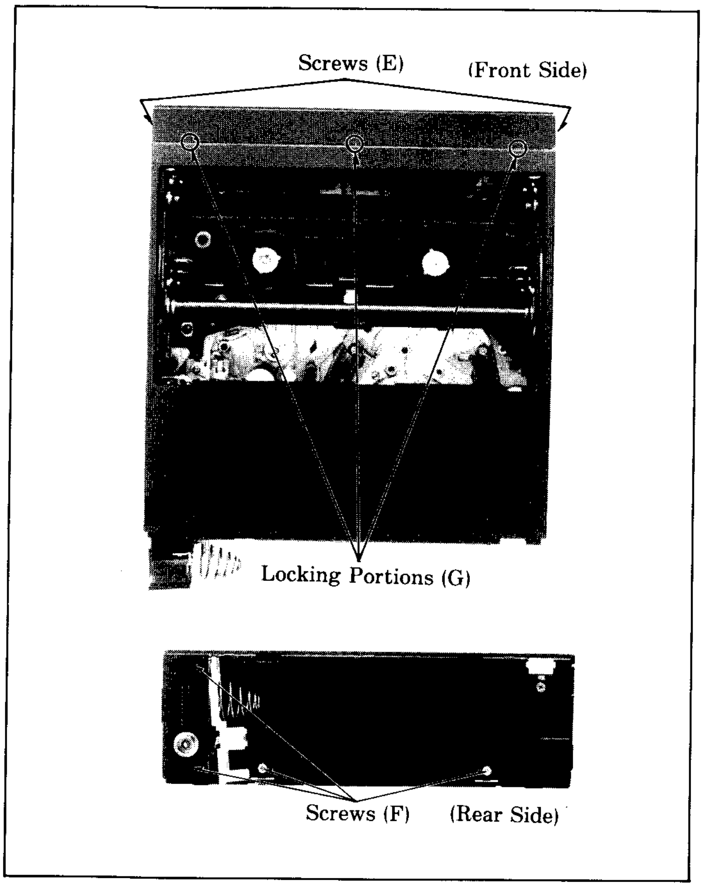


Fig. 4 Removal of the Top Case

Note:

When reinstalling, first insert the locking portions (G) into the projection of the front panel.

4. Removal of the Front Panel

(1) Unlock a locking tab (H) and hold both right and left ends of the front panel, then carefully pivot the top portion to unlock the locking portions (I) and remove it.

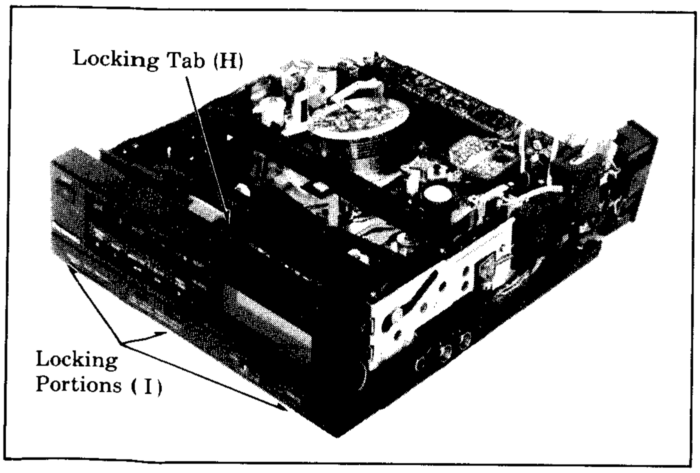


Fig. 5 Removal of the Front Panel-(1)

(2) Pull the portion (P) of the connector FS63 and disconnect a flexible connector FS63, and remove the front panel.

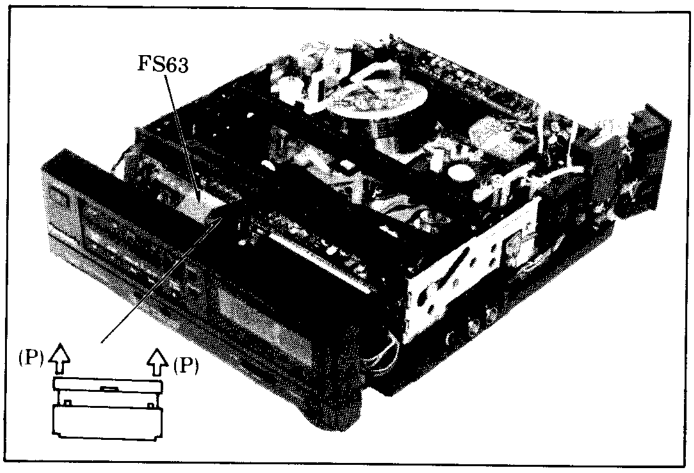


Fig. 6 Removal of the Front Panel-(2)

Note:

When reinstalling, first connect the connector and insert the locking portions (I) to the slot of the Bottom Case.

5. Removal of the Bottom Case

(1) Place the deck upside down so the bottom case faces upward.

(2) Remove 3 screws (J). Then remove the bottom case.

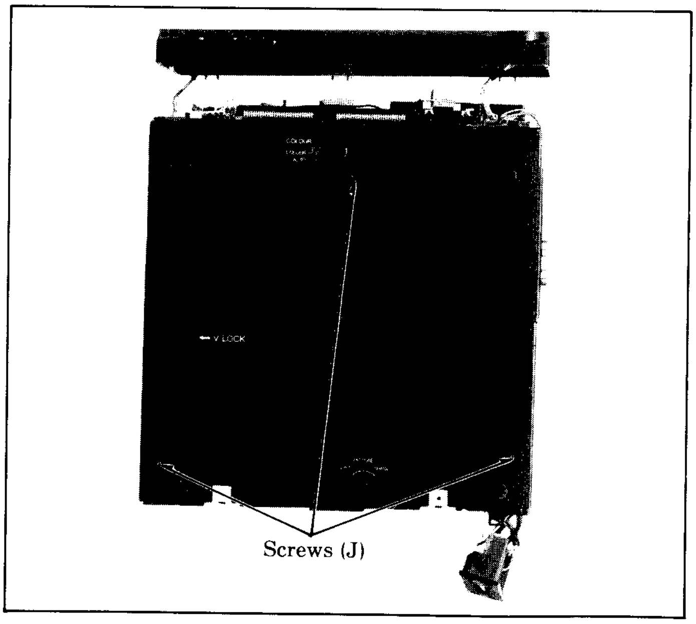


Fig. 7 Removal of the Bottom Case

6. Removal of the Cassette Compartment

(1) Remove 2 screws (K) and remove 5 screws (L) on the chassis.

(2) Eject the cassette up holder and disconnect a connector P218. Then remove the cassette up holder by lifting the front portion.

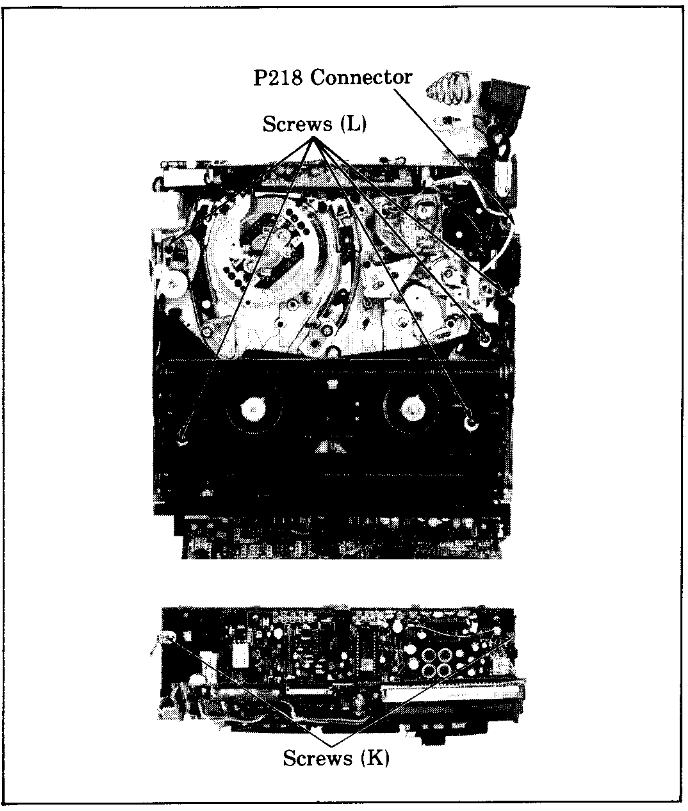

P218 Connector
Screws (L)
Screws (K)

Fig. 8 Removal of the Cassette Compartment-(1)

(3) Remove the supply photo TR unit, removing a screw (M).

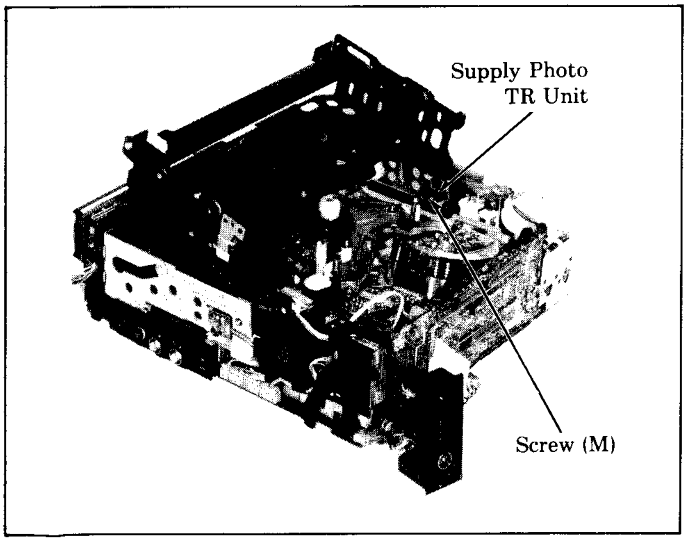

Supply Photo TR Unit
Screw (M)

Fig. 9 Removal of the Cassette Compartment-(2)

Note:

When reinstalling, first insert the back portion of the cassette compartment.

(4) If you want to eject the cassette compartment having a cassette tape without the electrical power, push (N) portion of the cassette lock lever, inside of Mechanical Chassis with small screwdriver.

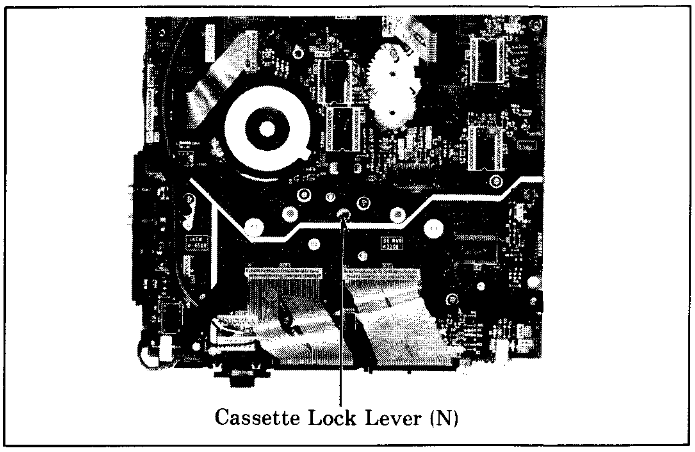

Cassette Lock Lever (N)

Fig. 10 Removal of the Cassette Compartment-(3)

7. Removal of the Luminance/Chrominance & Audio C. Board

(1) Remove 2 screws (O).
(2) Disconnect 2 direct connectors P33 and P34.
(3) Remove a shield case and disconnect 2 connectors P41 and P32.

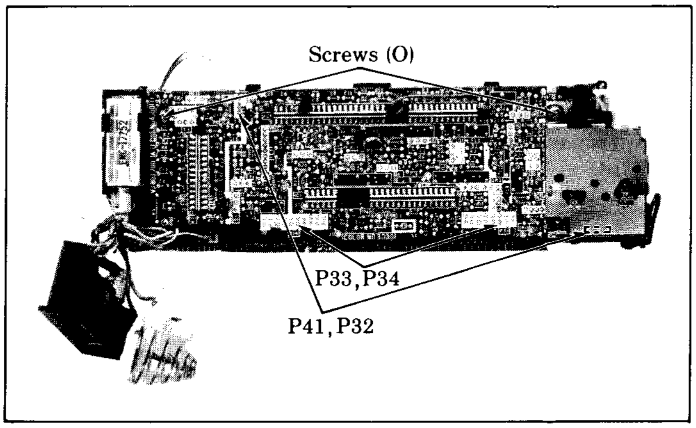

Screws (O)
P33,P34
P41,P32

Fig. 11 Removal of the Luminance/Chrominance & Audio C. Board

Note:

Do not damage the Fine Integrated Circuit during removal of the Luminance/Chrominance & Audio C. Board.

8. Removal of the Key Board Unit

(1) Pull the (P) portion. Then disconnect the flexible connector FS63.

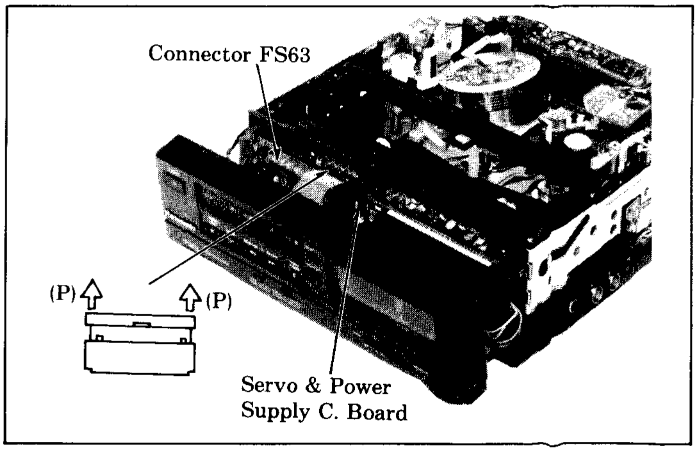

Connector FS63
(P)
(P)
Servo & Power Supply C. Board

Fig. 12 Removal of the Key Board Unit -(1)

(2) Unscrew the two screws (Q) and loosen 2 screws (R), then carefully tear off the earth film and lift the keyboard unit to remove.

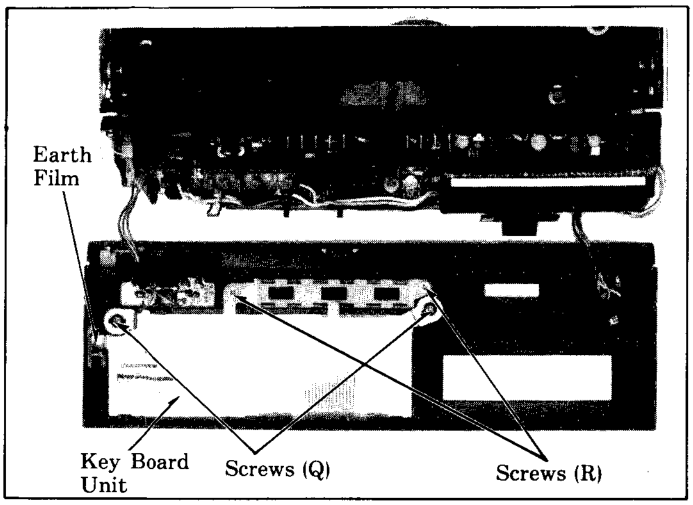

Earth Film
Key Board Unit
Screws (Q)
Screws (R)

Fig. 13 Removal of the Key Board Unit-(2)

9. Removal of the System Control C. Board

(1) Unlock the 5 locking tabs (S).
(2) Disconnect the connectors P203, P601, P602 and flexible connectors FS61 and FS62.
(3) Disconnect 2 hinges.

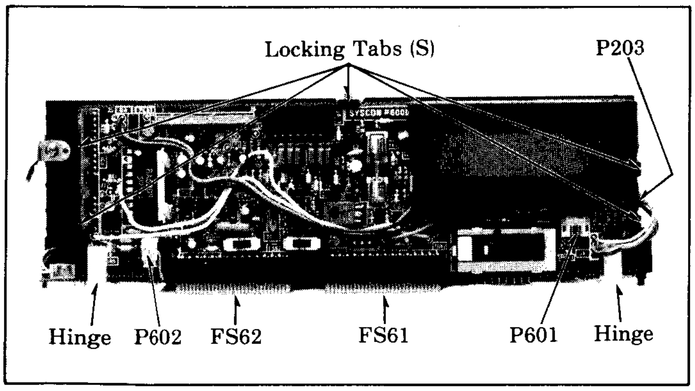

Locking Tabs (S)
P203
Hinge
P602
FS62
FS61
P601
Hinge

Fig. 14 Removal of the System Control C. Board

Notes:
(1) Use extreme care so as not to damage the locking tabs.
(2) Refer to Fig. 12 and disconnect 2 flexible connectors.

10. Removal of the Servo & Power Supply C. Board

(1) Remove 3 screws (T) on the Servo & Power Supply C. Board. Then remove 5 screws on the Main C. Board. (Refer to Fig. 16)
(2) Disconnect 2 direct connectors DS21 and DS22.

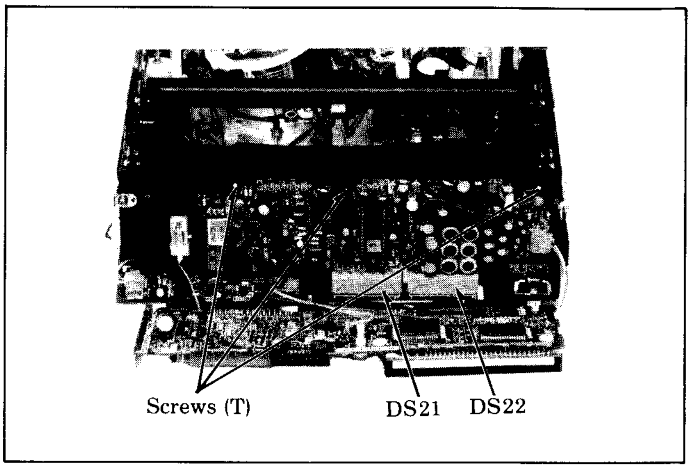

Screws (T)
DS21
DS22

Fig. 15 Removal of the Servo & Power Supply C. Board

11. Removal of the Main C. Board

(1) Place the deck upside down so the main C. Board faces upward.
(2) Remove 5 screws (U) and disconnect a flexible connectors, Servo & Power Supply C. Board, System Control C. Board and Luminance/Chrominance & Audio C. Boards.

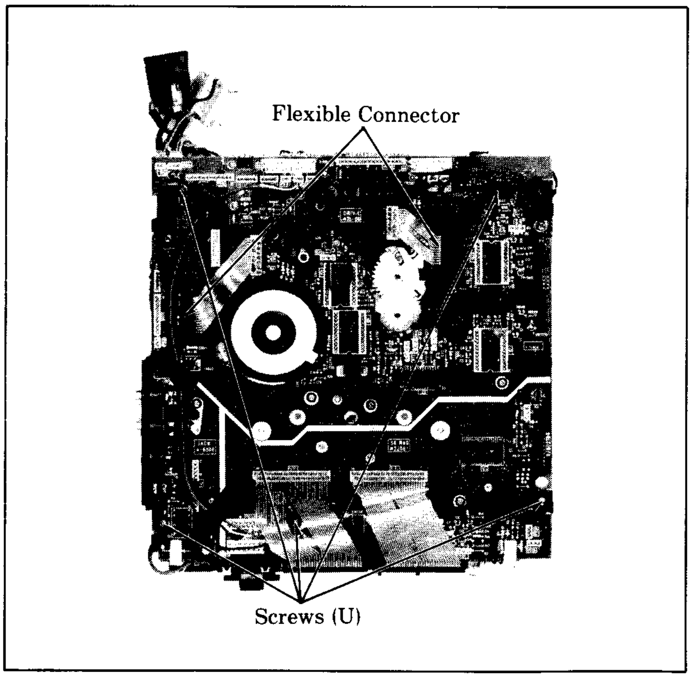

Flexible Connector
Screws (U)

Fig. 16 Removal of Main C. Board-(1)

Note:
Refer to item 7, 9, 10 and remove the C. Boards.

(4) Place the deck upside down so the chassis faces upward.
(5) Disconnect 12 connectors P207 ~ P214, P216 ~ P218 and P221. Then lift a chassis.

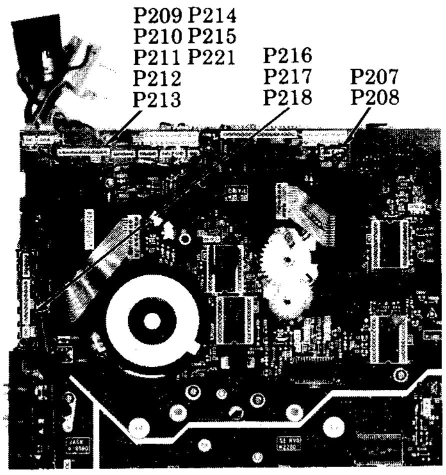

P209 P214
P210 P215
P211 P221
P212
P213
P216
P217
P218
P207
P208

Fig. 17 Removal of Main C. Board-(2)

2-1-3. REMOVING THE UPPER CYLINDER UNIT

First, remove two screws as shown in Fig. 18. Then unsolder 8 of the soldered portions indicated by arrows on the Upper Cylinder, and finally remove the Upper Cylinder.

Note:

Soldered portion can be easily removed by using solder sucking wire, etc.

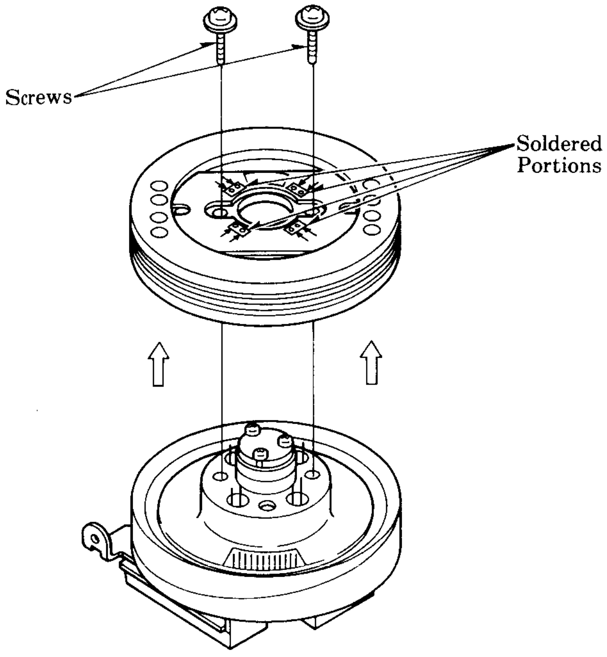

Screws
Soldered
Portions

Fig. 18

CAUTION

Do not loose the 3 small screws on the top of the cylinder as shown in Fig. 19.

If these 3 small screws are loosed, cylinder motor is broken and it can not remake.

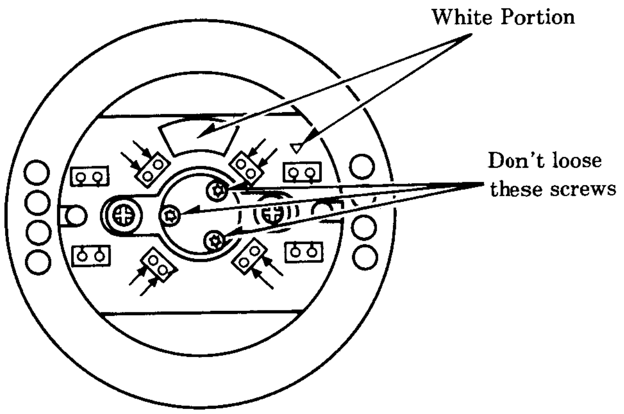

White Portion
Don't loose
these screws

Fig. 19

2-1-4. REINSTALLING THE UPPER CYLINDER

The Upper Cylinder unit can be reinstalled by reversing the removal procedure.

However, when upper cylinder is installing, it is extremely-carefull so that white portion of P.C. board of upper cylinder correctly match the white portion of bottom cylinder as shown in Fig. 20.

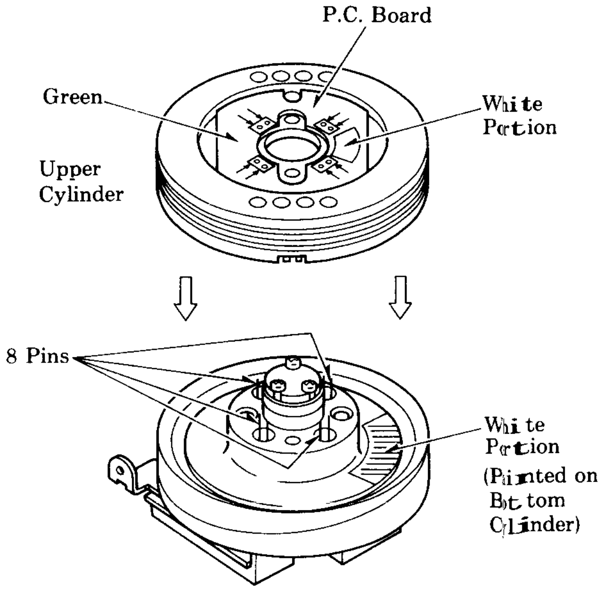

P.C. Board
Green
White
Portion
Upper
Cylinder
8 Pins
White
Portion
(Printed on
Bottom
Cylinder)

Fig. 20

Note:

If the Upper Cylinder Unit is reversely installed, no colour will appear when playing back a pre-recorded tape.

2-2. ELECTRICAL ADJUSTMENT PROCEDURES

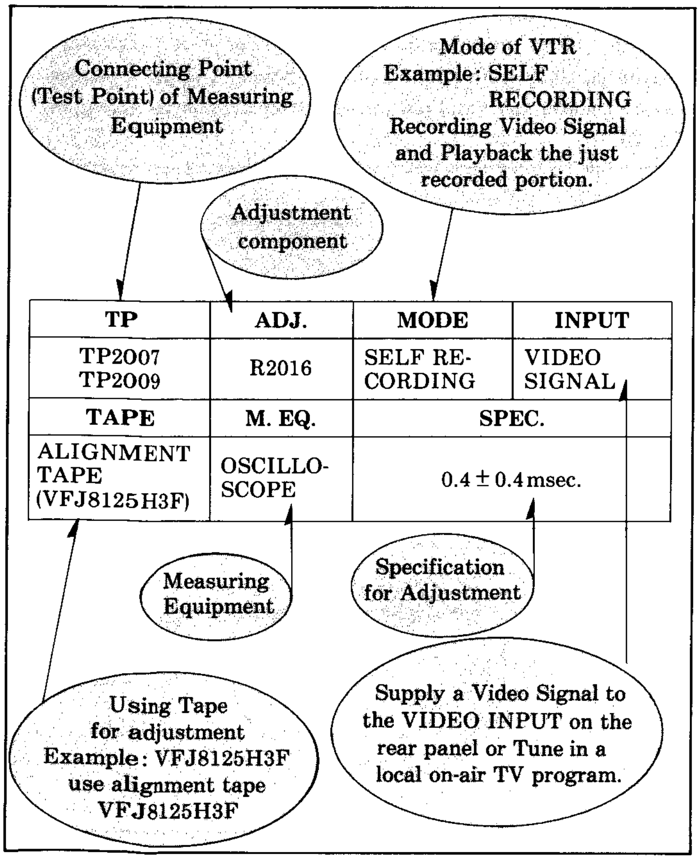
This section provides complete electrical adjustment procedures which may be required for electronic circuits of VHS Portable Video Cassette Recorder NV-180.

2-2-1. TEST EQUIPMENTS

To perform the electrical adjustments completely, following equipments are required.

1. VTVM (Vacuum Tube Volt Meter) or DVM (Digital Volt Meter)
   Voltage Range: 0.001 ~ 50 V
2. Dual-Trace Oscilloscope
   Voltage Range: 0.005 ~ 50 V/div.
   Frequency Range: DC ~ 10 MHz
   Probes: 10 : 1 or 1 : 1
3. Frequency Counter
   Frequency Range: 0 ~ 10 MHz
4. Signal Generator (Sinewave)
   Frequency Range: 0 ~ 10 MHz
5. Video Sweep Generator
   Frequency Range: 0 ~ 10 MHz
6. Colour Monitor TV
7. Plastic Tip Driver
8. VHS Alignment Tape (VFJ8125H3F)

2-2-2. HOW TO READ THE ADJUSTMENT PROCEDURES


Connecting Point (Test Point) of Measuring Equipment
Mode of VTR Example: SELF RECORDING Recording Video Signal and Playback the just recorded portion.
Adjustment component
Measuring Equipment
Specification for Adjustment
Using Tape for adjustment Example: VFJ8125H3F use alignment tape VFJ8125H3F
Supply a Video Signal to the VIDEO INPUT on the rear panel or Tune in a local on-air TV program.

TP	ADJ.	MODE	INPUT
TP2007 TP2009	R2016	SELF RECORDING	VIDEO SIGNAL
TAPE	M. EQ.	SPEC.	
ALIGNMENT TAPE (VFJ8125H3F)	OSCILLOSCOPE	0.4 ± 0.4 msec.	

Fig. 21

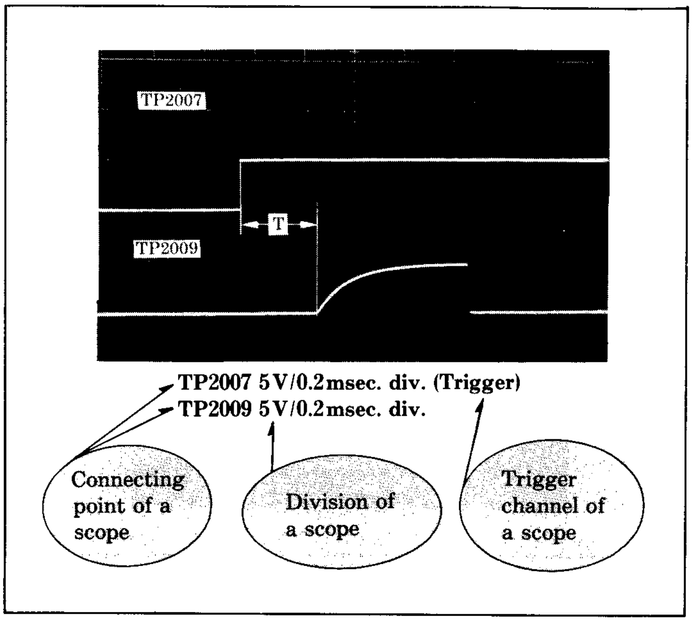

TP2007
TP2009
T
TP2007 5 V/0.2 msec. div. (Trigger)
TP2009 5 V/0.2 msec. div.
Connecting point of a scope
Division of a scope
Trigger channel of a scope

Fig. 22

POWER SUPPLY SECTION

2-2-3. REG +5 V ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP1003	R1003	STOP	
TAPE	M. EQ.	SPEC.	
	D.V.M	5.1 ± 0.1 V	

1. Input voltage from P214-2 is 12 ± 0.3 V DC.

SYSTEM CONTROL SECTION

2-2-4. UNDER CUT VOLTAGE ADJUSTMENT

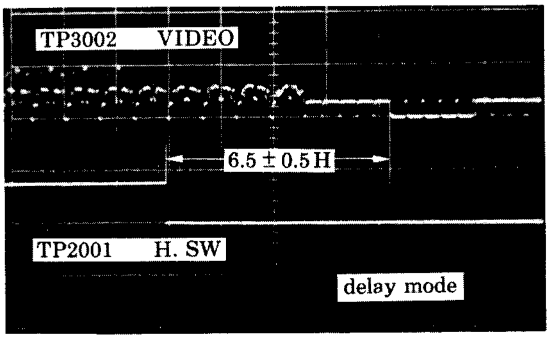
TP	ADJ.	MODE	INPUT
TP6001	VR6001	REC • PLAY	
TAPE	M. EQ.	SPEC.	
	D.V.M		

1. Input voltage from P214-2 is 10.6 ± 0.05 V DC.
2. Turn VR6001 fully counterclockwise, and turn it clockwise till the indication of the D.V.M. becomes Low level from High level.

SERVO SECTION

2-2-5. PG SHIFTER ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP2001 TP3002	VR2001	PLAY	
TAPE	**M. EQ.**	**SPEC.**	
ALIGNMENT TAPE (VFJ8125H3F)	OSCILLO-SCOPE	6.5±0.5H	



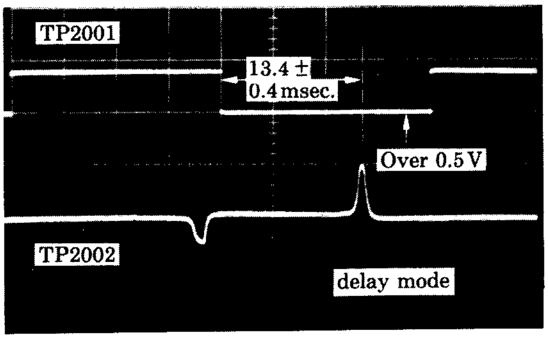
TP3002 2V/0.1msec. div.
TP2001 5V/0.1msec. div. (Trigger)

Fig. 23

2-2-6. TRACKING FIX ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP2001 TP2002	VR2002	SELF RE-CORDING	VIDEO SIGNAL
TAPE	**M. EQ.**	**SPEC.**	
BLANK TAPE	OSCILLO-SCOPE	T=13.4±0.4msec.	

1. TRACKING VR is center fix position.
2. Play back the just recorded portion.
3. Adjust VR2002 for 13.4±0.4msec. as shown below.



TP2001 5V/5msec. div. (Trigger)
TP2002 5V/5msec. div.

Fig. 24

2-2-7. FINE SLOW SPEED ADJUSTMENT

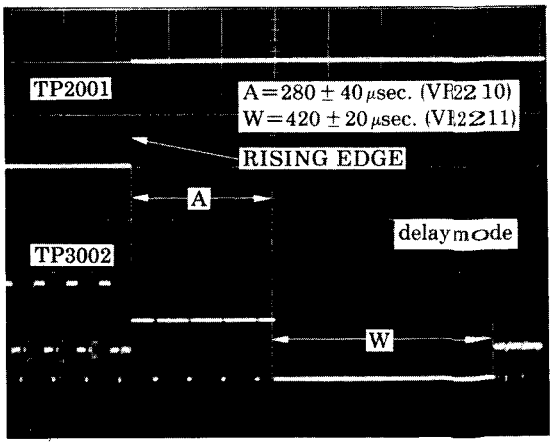
TP	ADJ.	MODE	INPUT
TP2015	VR2013	PLAY • STILL (SELF RE-CORDING)	
TAPE	**M. EQ.**	**SPEC.**	
BLANK TAPE	FREQUEN-CY COUNTER	650±15Hz	

1. SLOW TRACKING VR is center fix position.
2. Play back the just recorded portion.
3. Connect a jumper wire between TP2501 and the GND after making the deck in STILL mode.

2-2-8. ARTIFICIAL V-SYNC ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP2001 TP3002	VR2210 VR2211	STILL (SELF RE-CORDING	VIDEO SIGNAL
TAPE	**M. EQ.**	**SPEC.**	
BLANK TAPE	OSCILLO-SCOPE	A=285±40μsec. W=420±20μsec.	

1. Play back the just recorded portion and make the deck in STILL mode.



TP2001 5V/100μsec. div. (Trigger)
TP3002 2V/100μsec. div.

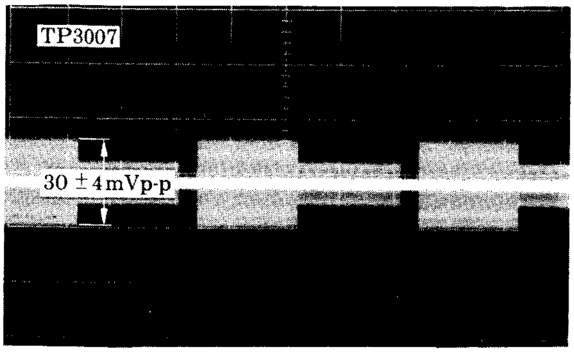
Fig. 25

LUMINANCE, CHROMINANCE SECTION

2-2-9. CONFIRMATION OF CHROMINANCE RECORDING CURRENT

TP	ADJ.	MODE	INPUT
TP3007		REC • PLAY	VIDEO SIGNAL
TAPE	**M. EQ.**	**SPEC.**	
BLANK TAPE	OSCILLO-SCOPE	30 ± 4mVp-p	

1. Turn VR3001 so that the Y-REC CURRENT becomes minimum.
2. After this adjustment, readjust Y-REC CURRENT (VR3001).

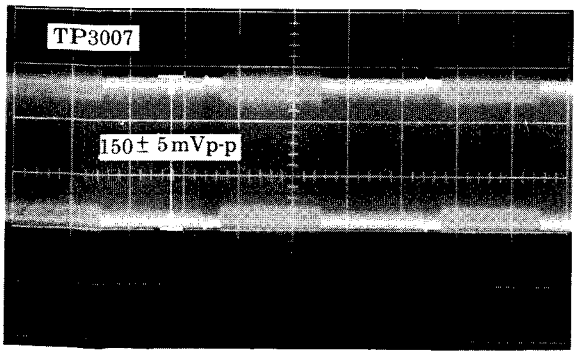


TP3007 20mV/5msec. div.

Fig. 26

2-2-10. LUMINANCE RECORDING CURRENT ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP3007	VR3001	REC • PLAY	VIDEO SIGNAL
TAPE	**M. EQ.**	**SPEC.**	
BLANK TAPE	OSCILLO-SCOPE	150 ± 5mVp-p	



TP3007 50mV/5msec. div.

Fig. 27

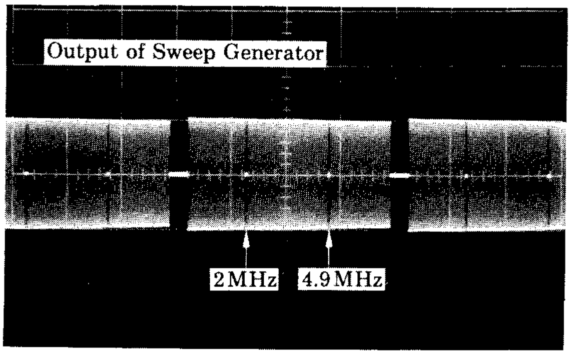
2-2-11. PICTURE VR ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP3501	VR3504	STOP	
TAPE	**M. EQ.**	**SPEC.**	
	V.T.V.M	2.0 ± 0.1V	

2-2-12. HEAD AMP PEAK FREQUENCY ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP3001	(FOR R', L' HEAD) C3035, C3036 VR3005, VR3006	PLAY	VIDEO SWEEP TP3010
TP3001	(FOR R, L HEAD) C3031, C3032 VR3007, VR3008	PLAY (TP317—TP3013 Short)	VIDEO SWEEP TP3011
TAPE	**M. EQ.**	**SPEC.**	
BLANK TAPE	VIDEO SWEEP OSCILLO-SCOPE	PEAK is 4.9MHz portion (2MHz : 4.9MHz = 2 : 3)	

1. Set the marker of sweep generator output at 2MHz and 4.9MHz.



50mV/5msec. div.

Fig. 28

2. Supply sweep generator output to TP3010.

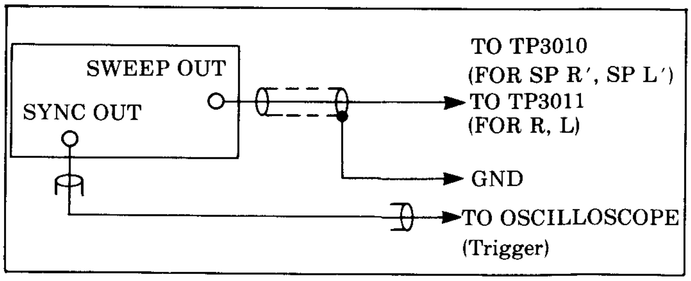
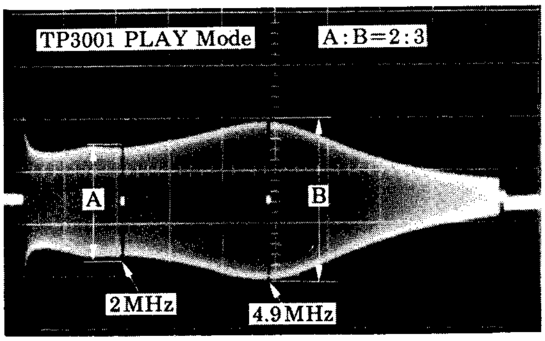


Fig. 29

3. Connect the oscilloscope to TP3001.
4. Adjust VR3005 (Q-SP R′) and VR3006 (Q-SP L′) for the envelopes of both channels as shown below 2MHz : 4.9MHz (2 : 3) in PLAY mode.

Note 1:

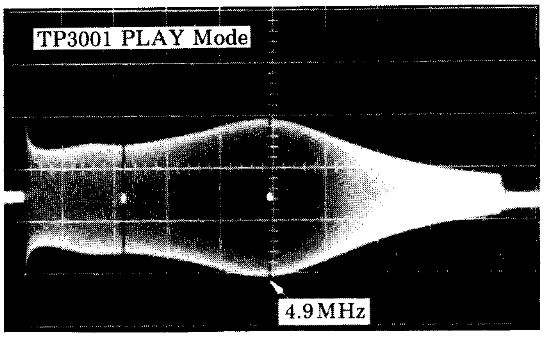
Any level of sweep generator output will be OK, but if waveform is distorted, decrease the output of sweep generator.



TP3001 0.1V/2msec. div.

Fig. 30

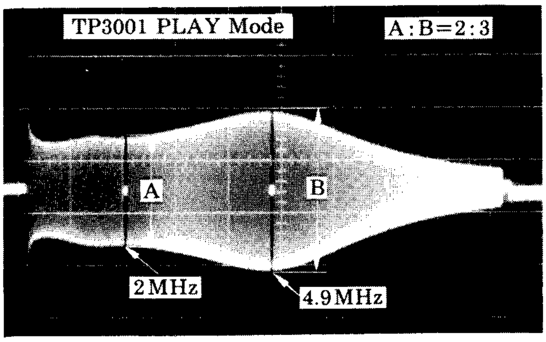
5. Adjust C3035 (PEAK-SP R′) and C3036 (PEAK-SP L′) so that the peak points become 4.9MHz in PLAY mode as shown below.



TP3001 0.1V/2msec. div.

Fig. 31

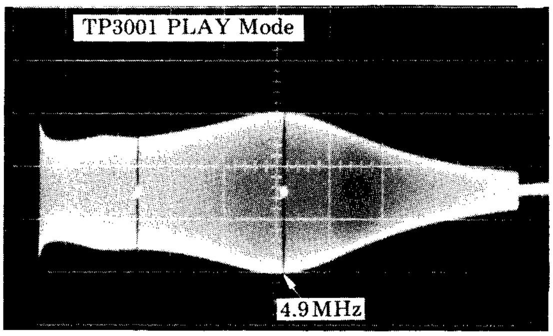
6. Supply sweep generator to TP3011.
7. Connect a jumper wire between TP3017 and TP3013 and adjust VR3007 (Q-R) and VR3008 (Q-L) for the envelope in PLAY mode as shown below at TP3001.
   Regarding with output level of sweep generator, refer to note 1.



TP3001 0.1V/2msec. div.

Fig. 32

8. Adjust C3031 (PEAK-L) and C3032 (PEAK-R) so that the peak point becomes 4.9MHz in PLAY mode as shown below.



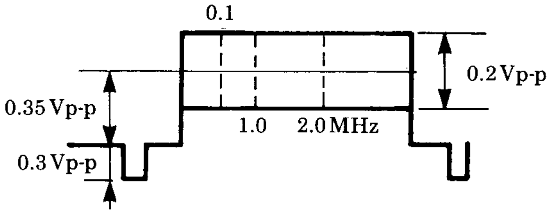
TP3001 0.1V/2msec. div.

Fig. 33

2-2-13. HEAD AMP FREQUENCY RESPONSE ADJUSTMENT

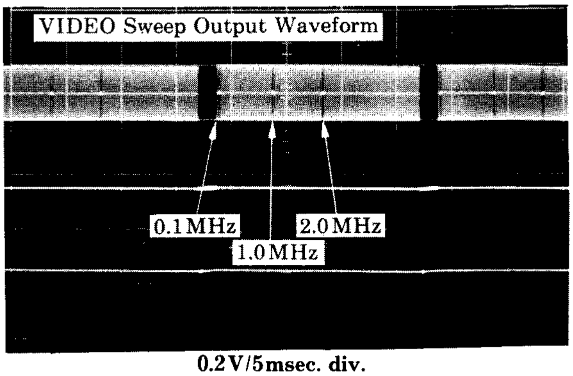
TP	ADJ.	MODE	INPUT
TP3002	(PLAY) VR3005 VR3006 (PLAY • STILL) VR3007 VR3008	PLAY, PLAY • STILL (SELF RECORDING)	VIDEO SWEEP
TAPE	**M. EQ.**	**SPEC.**	
BLANK TAPE	VIDEO SWEEP, OSCILLOSCOPE		

1. Set the sweep generator output as shown below.



Burst Signal off (75Ω terminated)

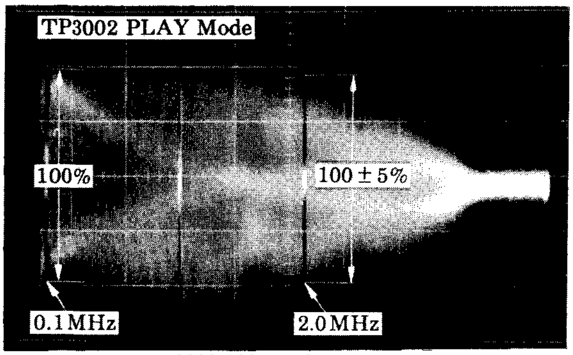
Fig. 34



0.2V/5msec. div.

Fig. 35

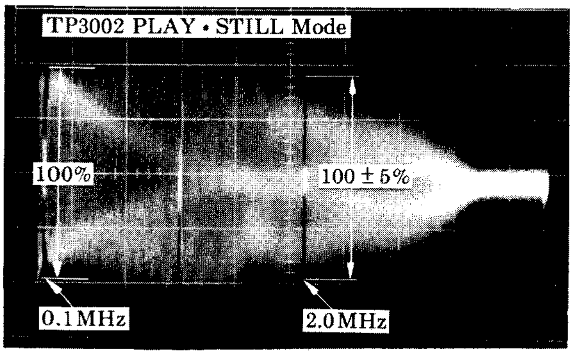
2. PICTURE VR ADJUSTMENT is completed.
3. Play back the just recorded portion.
4. Adjust VR3005 and VR3006 so that the waveforms become as shown below in PLAY mode.



TP3002 100mV/2msec. div.

Fig. 36

5. Make the deck in PLAY • STILL mode.
6. Adjust VR3007 (Q-R) and VR3008 (Q-L) so that the waveform in PLAY • STILL mode becomes as shown below.



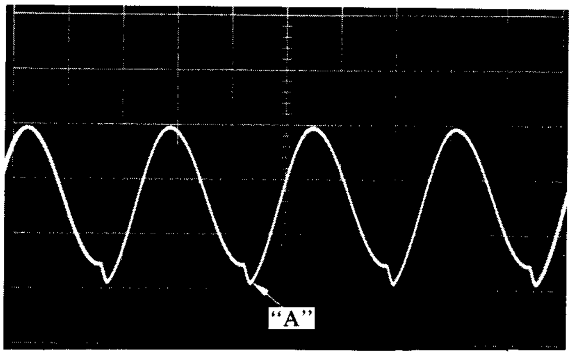
TP3002 100mV/2msec. div.

Fig. 37

2-2-14. SECAM KILLER ADJUSTMENT

TP	ADJ.	MODE	INPUT
TP8001	T8501	REC • PLAY	SECAM SIGNAL
TAPE	**M. EQ.**	**SPEC.**	
BLANK TAPE	OSCILLO-SCOPE		

1. Adjust T8501 so that the point "A" becomes minimum peak on the waveform as shown below.



TP8001 2V/50μsec. div.

Fig. 38

AUDIO SECTION

2-2-15. AUDIO BIAS CURRENT ADJUSTMENT

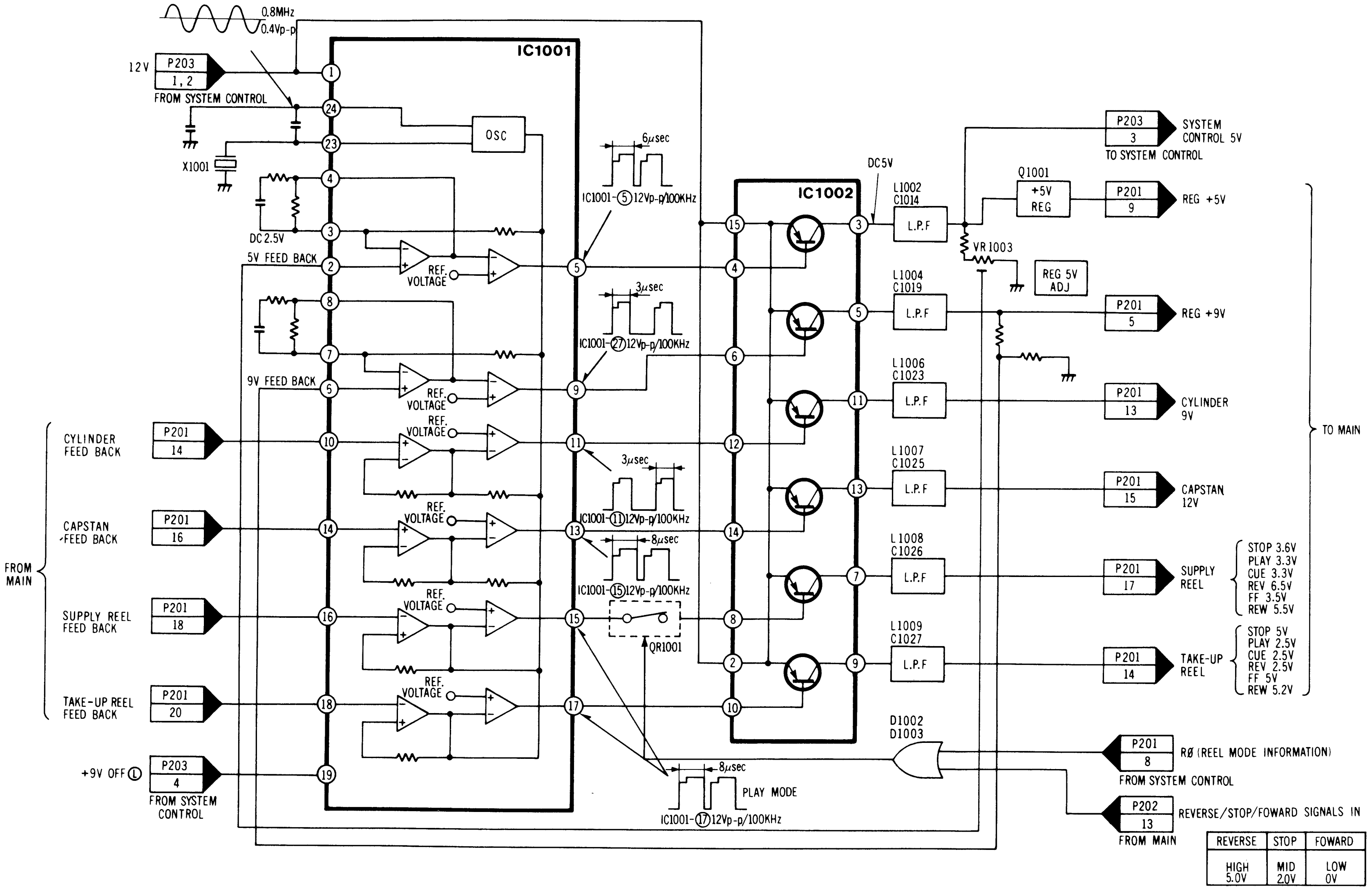
TP	ADJ.	MODE	INPUT
TP4002 TP4003	C4017	REC • PLAY	
TAPE	**M. EQ.**	**SPEC.**	
BLANK TAPE	V.T.V.M.	3.9 ± 0.1 mVrms	

2-2-16. AUDIO PLAYBACK LEVEL ADJUSTMENT

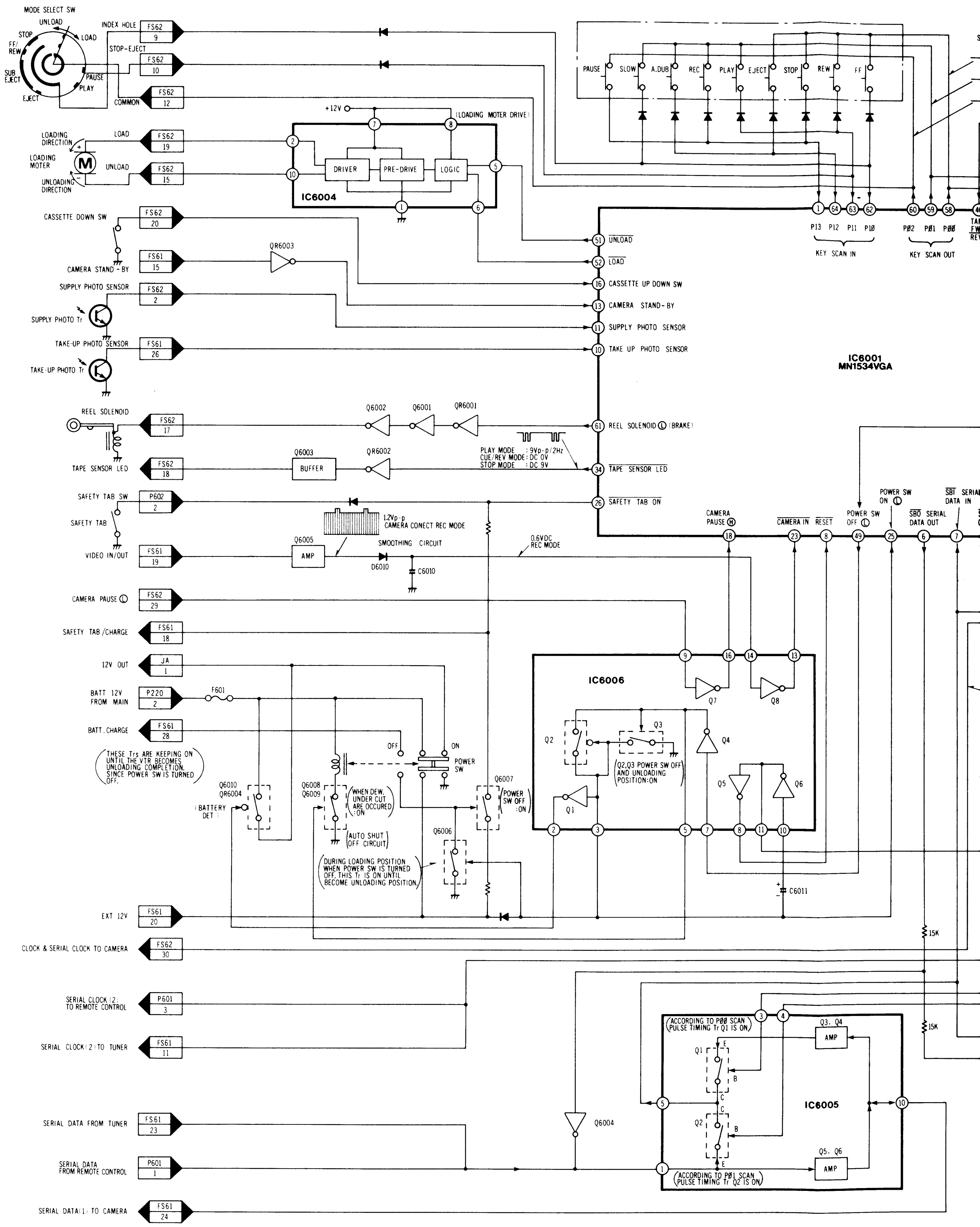
TP	ADJ.	MODE	INPUT
LINE OUT	VR4001	PLAY SELF RE-CORDING	1kHz, −60dBV (MIC IN)
TAPE	**M. EQ.**	**SPEC.**	
BLANK TAPE	V.T.V.M.	E-E LEVEL ±0.5dB (E-E LEVEL= 410 ± 90mVrms)	

SECTION 3
BLOCK AND SCHEMATIC DIAGRAM

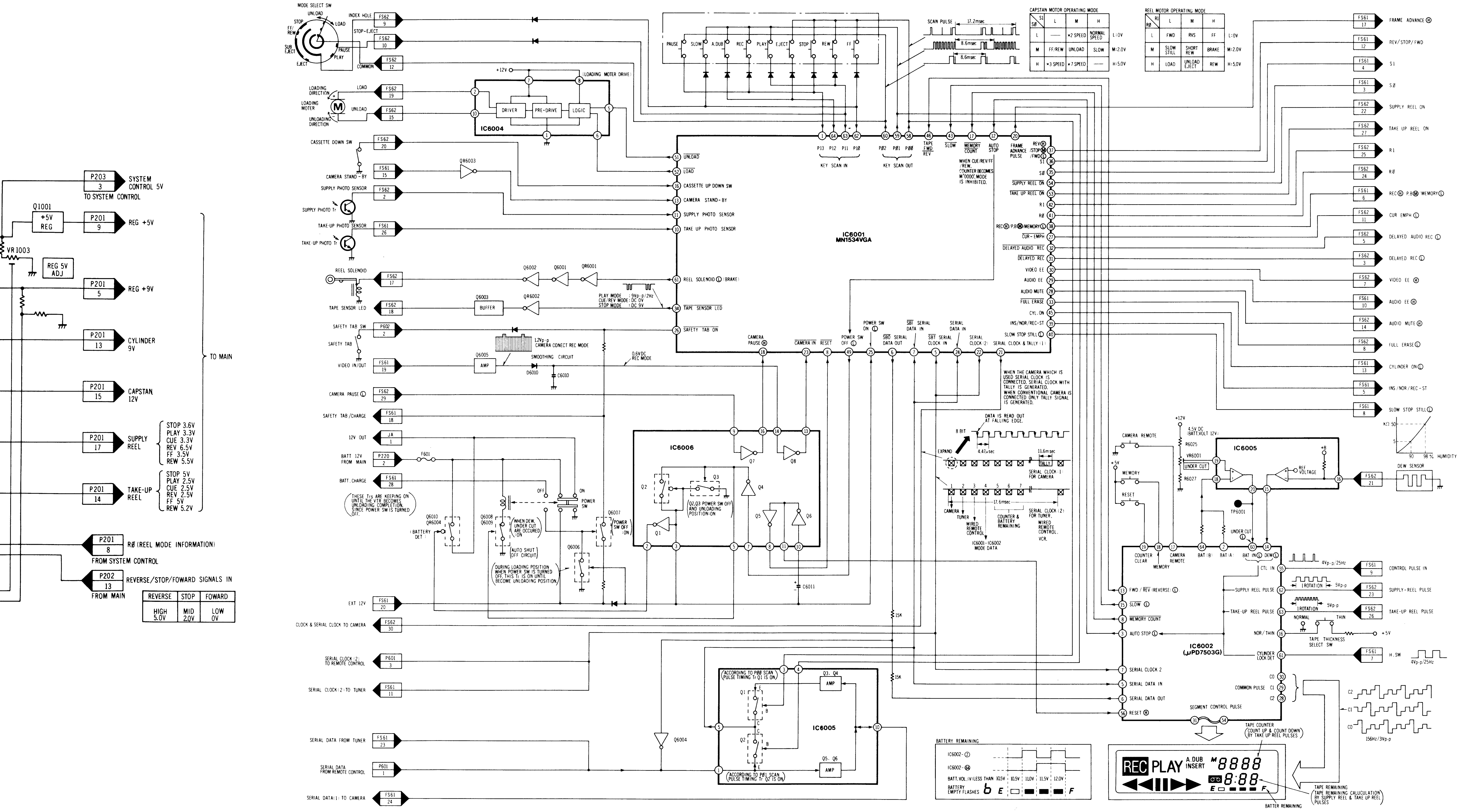
3-1. A.V.R. BLOCK DIAGRAM


0.8MHz
0.4Vp-p
12V
P203 1, 2
FROM SYSTEM CONTROL
IC1001
OSC
X1001
DC 2.5V
5V FEED BACK
9V FEED BACK
REF. VOLTAGE
6μsec
IC1001-⑤12Vp-p/100KHz
3μsec
IC1001-㉗12Vp-p/100KHz
3μsec
IC1001-⑪12Vp-p/100KHz
8μsec
IC1001-⑮12Vp-p/100KHz
QR1001
8μsec
PLAY MODE
IC1001-⑰12Vp-p/100KHz
IC1002
DC5V
L1002 C1014
L1004 C1019
L1006 C1023
L1007 C1025
L1008 C1026
L1009 C1027
L.P.F
VR1003
Q1001
+5V REG
REG 5V ADJ
P203 3
SYSTEM CONTROL 5V
TO SYSTEM CONTROL
P201 9
REG +5V
P201 5
REG +9V
P201 13
CYLINDER 9V
P201 15
CAPSTAN 12V
P201 17
SUPPLY REEL
STOP 3.6V
PLAY 3.3V
CUE 3.3V
REV 6.5V
FF 3.5V
REW 5.5V
P201 14
TAKE-UP REEL
STOP 5V
PLAY 2.5V
CUE 2.5V
REV 2.5V
FF 5V
REW 5.2V
TO MAIN
D1002
D1003
P201 8
RØ (REEL MODE INFORMATION)
FROM SYSTEM CONTROL
P202 13
REVERSE/STOP/FOWARD SIGNALS IN
FROM MAIN
REVERSE
STOP
FOWARD
HIGH 5.0V
MID 2.0V
LOW 0V
FROM MAIN
CYLINDER FEED BACK
P201 14
CAPSTAN FEED BACK
P201 16
SUPPLY REEL FEED BACK
P201 18
TAKE-UP REEL FEED BACK
P201 20
+9V OFF Ⓛ
P203 4
FROM SYSTEM CONTROL

3-2. SYSTEM CONTROL BLOCK DIAGRAM


MODE SELECT SW
UNLOAD
LOAD
STOP
FF/REW
SUB EJECT
EJECT
PAUSE
PLAY
INDEX HOLE
FS62 9
STOP-EJECT
FS62 10
COMMON
FS62 12
LOADING DIRECTION
LOADING MOTER
UNLOADING DIRECTION
LOAD
FS62 19
UNLOAD
FS62 15
+12V
(LOADING MOTER DRIVE)
DRIVER
PRE-DRIVE
LOGIC
IC6004
CASSETTE DOWN SW
FS62 20
CAMERA STAND-BY
FS61 15
QR6003
SUPPLY PHOTO SENSOR
FS62 2
SUPPLY PHOTO Tr
TAKE-UP PHOTO SENSOR
FS61 26
TAKE-UP PHOTO Tr
REEL SOLENOID
FS62 17
Q6002
Q6001
QR6001
TAPE SENSOR LED
FS62 18
Q6003
BUFFER
QR6002
PLAY MODE : 9Vp-p/2Hz
CUE/REV MODE : DC 0V
STOP MODE : DC 9V
SAFETY TAB SW
P602 2
SAFETY TAB
1.2Vp-p
CAMERA CONECT REC MODE
VIDEO IN/OUT
FS61 19
Q6005
AMP
SMOOTHING CIRCUIT
D6010
C6010
0.6VDC
REC MODE
CAMERA PAUSE Ⓛ
FS62 29
SAFETY TAB/CHARGE
FS61 18
12V OUT
JA 1
BATT 12V FROM MAIN
P220 2
F601
BATT. CHARGE
FS61 28
(THESE Trs ARE KEEPING ON UNTIL THE VTR BECOMES UNLOADING COMPLETION, SINCE POWER SW IS TURNED OFF.)
Q6010
QR6004
(BATTERY DET)
Q6008
Q6009
(WHEN DEW, UNDER CUT ARE OCCURED :ON)
(AUTO SHUT OFF CIRCUIT)
OFF
ON
POWER SW
Q6007
(POWER SW OFF :ON)
Q6006
(DURING LOADING POSITION WHEN POWER SW IS TURNED OFF, THIS Tr IS ON UNTIL BECOME UNLOADING POSITION.)
EXT 12V
FS61 20
CLOCK & SERIAL CLOCK TO CAMERA
FS62 30
SERIAL CLOCK (2) TO REMOTE CONTROL
P601 3
SERIAL CLOCK (2) TO TUNER
FS61 11
SERIAL DATA FROM TUNER
FS61 23
SERIAL DATA FROM REMOTE CONTROL
P601 1
SERIAL DATA (1) TO CAMERA
FS61 24
Q6004
PAUSE
SLOW
A.DUB
REC
PLAY
EJECT
STOP
REW
FF
P13
P12
P11
P10
KEY SCAN IN
PØ2
PØ1
PØØ
KEY SCAN OUT
UNLOAD
LOAD
CASSETTE UP DOWN SW
CAMERA STAND-BY
SUPPLY PHOTO SENSOR
TAKE UP PHOTO SENSOR
IC6001
MN1534VGA
REEL SOLENOID Ⓛ (BRAKE)
TAPE SENSOR LED
SAFETY TAB ON
CAMERA PAUSE Ⓗ
CAMERA IN
RESET
POWER SW OFF Ⓛ
POWER SW ON Ⓛ
SBO SERIAL DATA OUT
SBI SERIAL DATA IN
IC6006
Q7
Q8
Q2
Q3
(Q2,Q3 POWER SW OFF AND UNLOADING POSITION:ON)
Q4
Q5
Q6
Q1
C6011
15K
15K
IC6005
(ACCORDING TO PØØ SCAN PULSE TIMING Tr Q1 IS ON)
(ACCORDING TO PØ1 SCAN PULSE TIMING Tr Q2 IS ON)
Q3, Q4
AMP
Q5, Q6
AMP

3-2. SYSTEM CONTROL BLOCK DIAGRAM


MODE SELECT SW
UNLOAD
LOAD
STOP
FF/REW
SUB EJECT
EJECT
PAUSE
PLAY
COMMON
INDEX HOLE
STOP-EJECT
FS62 9
FS62 10
FS62 12
+12V
LOADING MOTER DRIVE
LOADING DIRECTION
LOADING MOTER
UNLOADING DIRECTION
LOAD
UNLOAD
FS62 19
FS62 15
DRIVER
PRE-DRIVE
LOGIC
IC6004
CASSETTE DOWN SW
FS62 20
CAMERA STAND-BY
FS61 15
QR6003
SUPPLY PHOTO SENSOR
FS62 2
SUPPLY PHOTO Tr
TAKE-UP PHOTO SENSOR
FS61 26
TAKE-UP PHOTO Tr
REEL SOLENOID
FS62 17
Q6002
Q6001
QR6001
TAPE SENSOR LED
FS62 18
Q6003 BUFFER
QR6002
PLAY MODE : 5Vp-p/2Hz
CUE/REV MODE : DC 0V
STOP MODE : DC 9V
SAFETY TAB SW
P602 2
SAFETY TAB
1.2Vp-p CAMERA CONECT REC MODE
Q6005 AMP
SMOOTHING CIRCUIT
D6010
C6010
0.6V DC REC MODE
VIDEO IN/OUT
FS61 19
CAMERA PAUSE
FS62 29
SAFETY TAB/CHARGE
FS61 18
12V OUT
JA 1
BATT 12V FROM MAIN
P220 2
F601
BATT. CHARGE
FS61 28
THESE Trs ARE KEEPING ON UNTIL THE VTR BECOMES UNLOADING COMPLETION SINCE POWER SW IS TURNED OFF.
Q6010 Q6004
BATTERY DET
Q6008 Q6009
WHEN DEW, UNDER CUT ARE OCCURED ON
AUTO SHUT OFF CIRCUIT
DURING LOADING POSITION WHEN POWER SW IS TURNED OFF, THIS Tr IS ON UNTIL BECOME UNLOADING POSITION.
OFF
ON
POWER SW
Q6007
POWER SW OFF: ON
Q6006
IC6006
Q2
Q3
Q4
Q1
Q5
Q6
Q7
Q8
Q2, Q3 POWER SW OFF AND UNLOADING POSITION
C6011
EXT 12V
FS61 20
CLOCK & SERIAL CLOCK TO CAMERA
FS62 30
SERIAL CLOCK (2) TO REMOTE CONTROL
P601 3
SERIAL CLOCK (2) TO TUNER
FS61 11
SERIAL DATA FROM TUNER
FS61 23
SERIAL DATA FROM REMOTE CONTROL
P601 1
SERIAL DATA (1) TO CAMERA
FS61 24
Q6004
IC6005
ACCORDING TO PØØ SCAN PULSE TIMING Tr Q1 IS ON
ACCORDING TO PØ1 SCAN PULSE TIMING Tr Q2 IS ON
Q3, Q4 AMP
Q5, Q6 AMP
15K
PAUSE
SLOW
A.DUB
REC
PLAY
EJECT
STOP
REW
FF
SCAN PULSE
17.2msec
8.6msec
8.6msec
IC6001
MN1534VGA
UNLOAD
LOAD
CASSETTE UP DOWN SW
CAMERA STAND-BY
SUPPLY PHOTO SENSOR
TAKE UP PHOTO SENSOR
REEL SOLENOID (BRAKE)
TAPE SENSOR LED
SAFETY TAB ON
P13 P12 P11 P10
KEY SCAN IN
PØ2 PØ1 PØØ
KEY SCAN OUT
TAPE FWD REV
SLOW
MEMORY COUNT
AUTO STOP
FRAME ADVANCE PULSE
REV/STOP/FWD
WHEN CUE/REV/FF/REW, COUNTER BECOMES M'0000', MODE IS INHIBITED.
S1
SØ
SUPPLY REEL ON
TAKE UP REEL ON
R1
RØ
REC P.B MEMORY
CUR-EMPH
DELAYED AUDIO REC
DELAYED REC
VIDEO EE
AUDIO EE
AUDIO MUTE
FULL ERASE
CYL. ON
INS/NOR/REC-ST
SLOW STOP STILL
SERIAL CLOCK & TALLY (1)
SERIAL CLOCK (2)
SERIAL DATA IN
SBT SERIAL CLOCK IN
SBI SERIAL DATA OUT
POWER SW ON
POWER SW OFF
CAMERA PAUSE
CAMERA IN
RESET
WHEN THE CAMERA WHICH IS USED SERIAL CLOCK IS CONNECTED, SERIAL CLOCK WITH TALLY IS GENERATED. WHEN CONVENTIONAL CAMERA IS CONNECTED ONLY TALLY SIGNAL IS GENERATED.
DATA IS READ OUT AT FALLING EDGE.
8 BIT
EXPAND
4.47μsec
11.6msec
TALLY
SERIAL CLOCK (1) FOR CAMERA
17.6msec
CAMERA
TUNER
WIRED REMOTE CONTROL
COUNTER & BATTERY REMAINING
SERIAL CLOCK (2) FOR TUNER, WIRED REMOTE CONTROL, VCR.
IC6001-IC6002 MODE DATA
FS61 17 FRAME ADVANCE
FS61 12 REV/STOP/FWD
FS61 4 S1
FS61 3 SØ
FS62 22 SUPPLY REEL ON
FS62 27 TAKE UP REEL ON
FS62 25 R1
FS62 24 RØ
FS61 6 REC P.B MEMORY
FS62 11 CUR EMPH
FS62 5 DELAYED AUDIO REC
FS62 3 DELAYED REC
FS62 7 VIDEO EE
FS61 10 AUDIO EE
FS62 14 AUDIO MUTE
FS62 8 FULL ERASE
FS61 13 CYLINDER ON
FS61 5 INS/NOR/REC-ST
FS61 8 SLOW STOP STILL
KΩ
90 98 % HUMIDITY
DEW SENSOR
FS62 21
+12V
4.5V DC (BATT. VOLT 12V)
R6025
VR6001
UNDER CUT
R6027
CAMERA REMOTE
MEMORY
RESET
+5V
+B
REF VOLTAGE
IC6005
TP6001
UNDER CUT
COUNTER CLEAR
CAMERA REMOTE
MEMORY
BAT (B)
BAT (A)
BAT IN
DEW
CTL IN
4Vp-p/25Hz
FS61 9 CONTROL PULSE IN
SUPPLY REEL PULSE
1 ROTATION
5Vp-p
FS62 23 SUPPLY-REEL PULSE
TAKE-UP REEL PULSE
FS62 26 TAKE-UP REEL PULSE
NORMAL
THIN
+5V
NOR/THIN
TAPE THICKNESS SELECT SW
CYLINDER LOCK DET
FS61 7 H.SW
4Vp-p/25Hz
FWD/REV (REVERSE)
SLOW
MEMORY COUNT
AUTO STOP
IC6002 (μPD7503G)
SERIAL CLOCK 2
SERIAL DATA IN
SERIAL DATA OUT
RESET
C0
C1
C2
COMMON PULSE
SEGMENT CONTROL PULSE
156Hz/3Vp-p
TAPE COUNTER (COUNT UP & COUNT DOWN BY TAKE UP REEL PULSES)
REC PLAY A.DUB INSERT M8888
8:88
E F
TAPE REMAINING (TAPE REMAINING CALUCULATION BY SUPPLY REEL & TAKE UP REEL PULSES)
BATTER REMAINING
BATTERY REMAINING
IC6002-②
IC6002-64
BATT. VOL (V) LESS THAN 10.5V 10.5V 11.0V 11.5V 12.0V
BATTERY EMPTY FLASHES b E F
P203 3 SYSTEM CONTROL 5V
TO SYSTEM CONTROL
Q1001 +5V REG
P201 9 REG +5V
VR1003
REG 5V ADJ
P201 5 REG +9V
P201 13 CYLINDER 9V
P201 15 CAPSTAN 12V
TO MAIN
P201 17 SUPPLY REEL
STOP 3.6V
PLAY 3.3V
CUE 3.3V
REV 6.5V
FF 3.5V
REW 5.5V
P201 14 TAKE-UP REEL
STOP 5V
PLAY 2.5V
CUE 2.5V
REV 2.5V
FF 5V
REW 5.2V
P201 8 RØ (REEL MODE INFORMATION)
FROM SYSTEM CONTROL
P202 13 REVERSE/STOP/FOWARD SIGNALS IN
FROM MAIN

CAPSTAN MOTOR OPERATING MODE

SØ \ S1	L	M	H	
L	—	×2 SPEED	NORMAL SPEED	L:0V
M	FF/REW	UNLOAD	SLOW	M:2.0V
H	×3 SPEED	×7 SPEED	—	H:5.0V

REEL MOTOR OPERATING MODE

RØ \ R1	L	M	H	
L	FWD	RVS	FF	L:0V
M	SLOW STILL	SHORT REW	BRAKE	M:2.0V
H	LOAD	UNLOAD EJECT	REW	H:5.0V

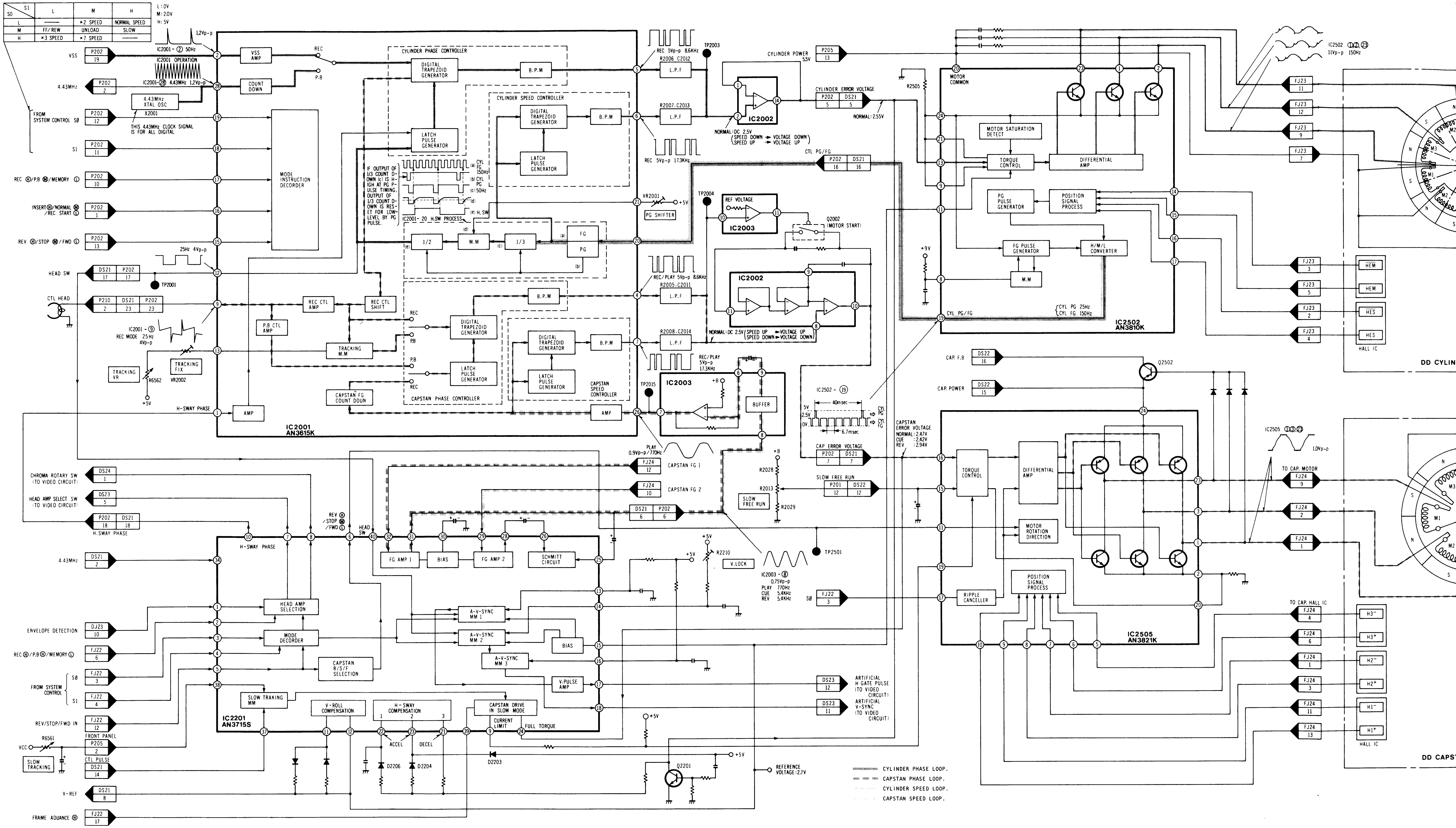
REVERSE	STOP	FOWARD
HIGH 5.0V	MID 2.0V	LOW 0V

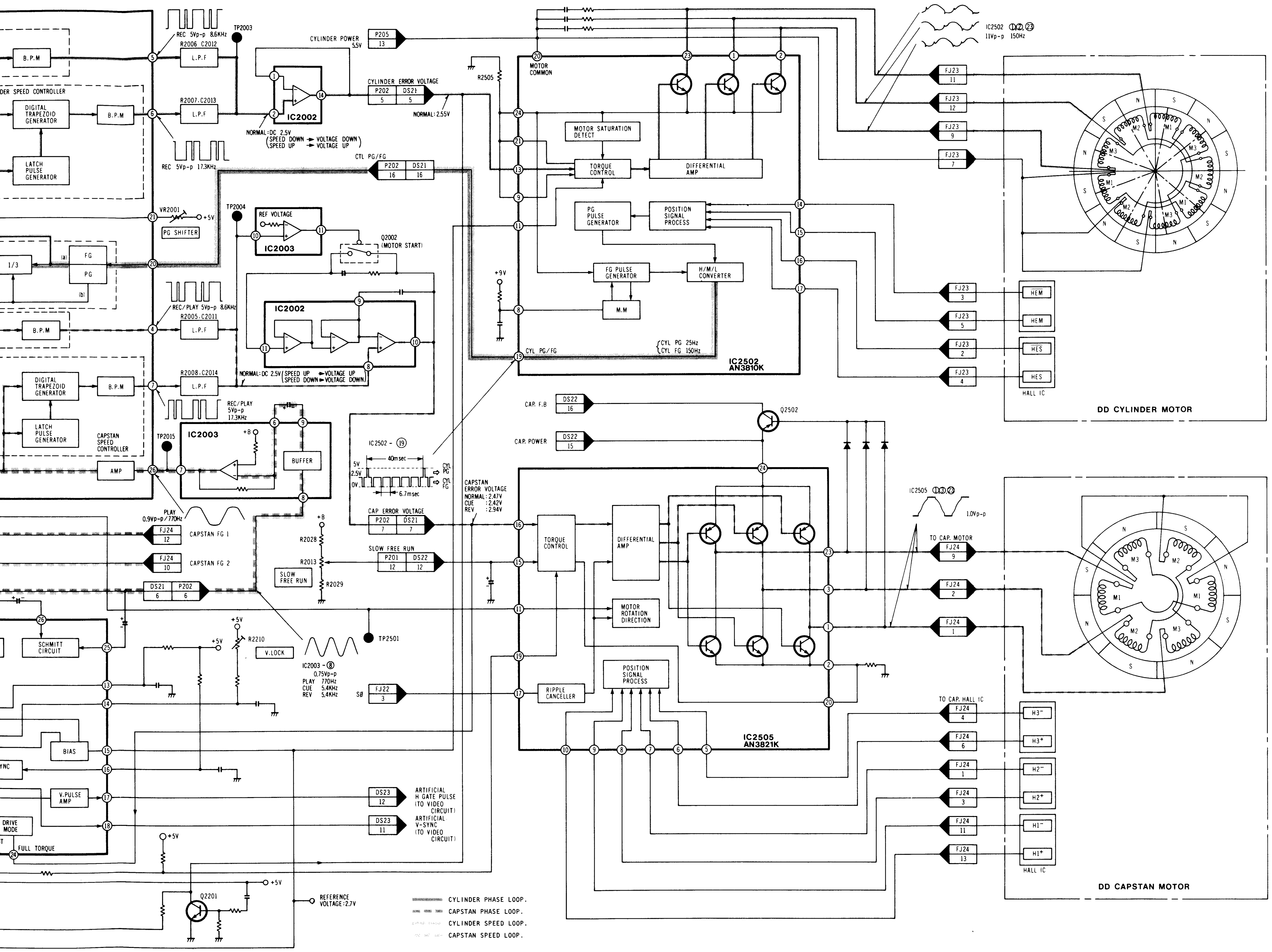
Next Page:
MAIN SERVO Section

3-3. MAIN SERVO BLOCK DIAGRAM

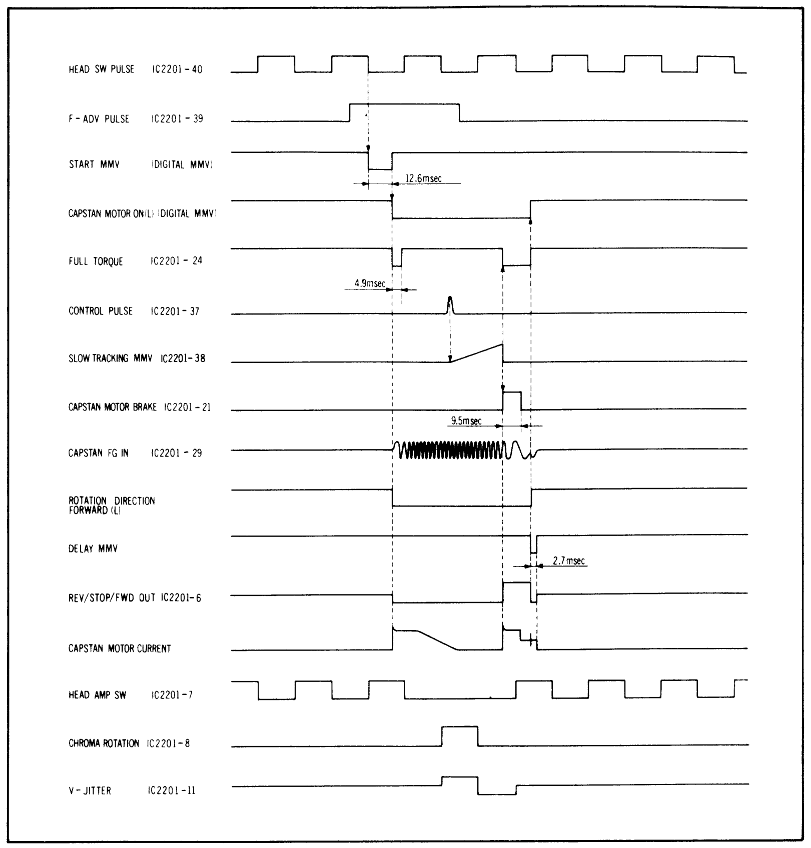
S0 \ S1	L	M	H
L	——	×2 SPEED	NORMAL SPEED
M	FF/REW	UNLOAD	SLOW
H	×3 SPEED	×7 SPEED	——

L : 0V
M : 2.0V
H : 5V

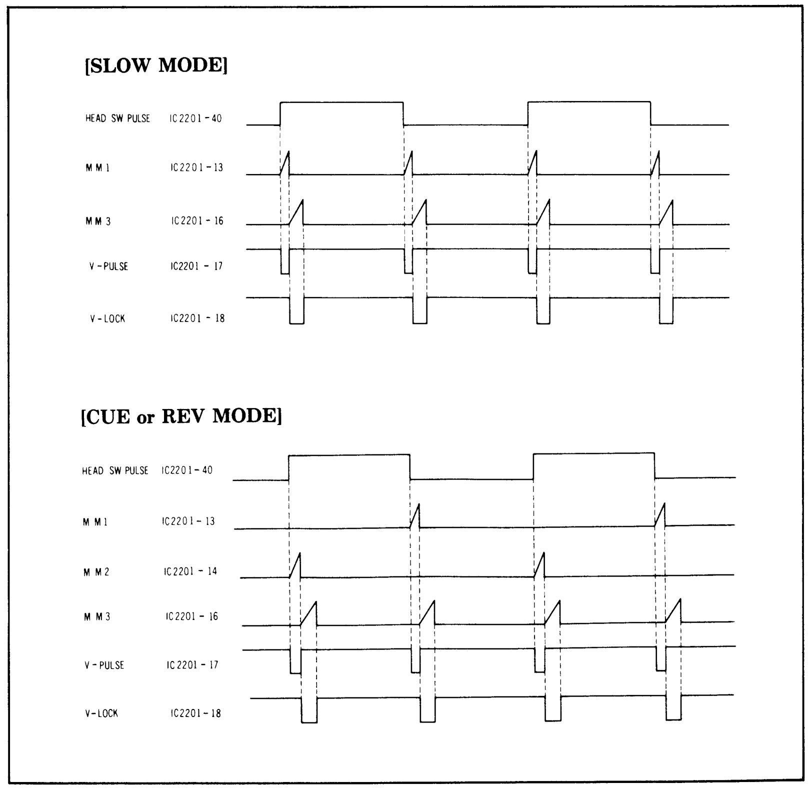

IC2001 AN3615K
IC2201 AN3715S
IC2002
IC2003
IC2502 AN3810K
IC2505 AN3821K
VSS
4.43MHz
FROM SYSTEM CONTROL S0
S1
REC Ⓗ/P.B Ⓜ/MEMORY Ⓛ
INSERT Ⓗ/NORMAL Ⓜ /REC START Ⓛ
REV Ⓗ/STOP Ⓜ/FWD Ⓛ
HEAD SW
CTL HEAD
IC2001-② 50Hz
1.2Vp-p
IC2001 OPERATION
IC2001-㉘ 4.43MHz 1.2Vp-p
4.43MHz XTAL OSC
X2001
THIS 4.43MHz CLOCK SIGNAL IS FOR ALL DIGITAL
VSS AMP
COUNT DOWN
REC
P.B
MODE INSTRUCTION DECORDER
CYLINDER PHASE CONTROLLER
DIGITAL TRAPEZOID GENERATOR
B.P.M
LATCH PULSE GENERATOR
CYLINDER SPEED CONTROLLER
IF OUTPUT OF 1/3 COUNT DOWN (c) IS HIGH AT PG PULSE TIMING, OUTPUT OF 1/3 COUNT DOWN IS RESET FOR LOW-LEVEL BY PG PULSE.
(a) CYL FG 150Hz
(b) CYL PG
(c) 50Hz
(e) H.SW
IC2001-20 H.SW PROCESS
1/2
M.M
1/3
FG
PG
25Hz 4Vp-p
TP2001
REC CTL AMP
REC CTL SHIFT
P.B CTL AMP
TRACKING M.M
TRACKING VR
R6562
TRACKING FIX
VR2002
IC2001-⑨ REC MODE 25Hz 4Vp-p
+5V
H-SWAY PHASE
AMP
CAPSTAN FG COUNT DOWN
CAPSTAN PHASE CONTROLLER
CAPSTAN SPEED CONTROLLER
REC 5Vp-p 8.6KHz
R2006 C2012
L.P.F
TP2003
R2007.C2013
REC 5Vp-p 17.3KHz
VR2001
PG SHIFTER
TP2004
REF VOLTAGE
Q2002 (MOTOR START)
R2005.C2011
REC/PLAY 5Vp-p 8.6KHz
R2008.C2014
REC/PLAY 5Vp-p 17.3KHz
NORMAL: DC 2.5V (SPEED UP → VOLTAGE UP / SPEED DOWN → VOLTAGE DOWN)
NORMAL: DC 2.5V (SPEED DOWN → VOLTAGE DOWN / SPEED UP → VOLTAGE UP)
TP2015
BUFFER
PLAY 0.9Vp-p/770Hz
CAPSTAN FG 1
CAPSTAN FG 2
CYLINDER POWER 5.5V
CYLINDER ERROR VOLTAGE
NORMAL: 2.55V
CTL PG/FG
CYL PG/FG
CYL PG 25Hz
CYL FG 150Hz
IC2502-⑲
40msec
6.7msec
CAPSTAN ERROR VOLTAGE NORMAL: 2.47V CUE: 2.42V REV: 2.94V
CAP. ERROR VOLTAGE
SLOW FREE RUN
R2028
R2013
R2029
R2210
V.LOCK
TP2501
IC2003-⑧ 0.75Vp-p PLAY 770Hz CUE 5.4KHz REV 5.4KHz
CHROMA ROTARY SW (TO VIDEO CIRCUIT)
HEAD AMP SELECT SW (TO VIDEO CIRCUIT)
H.SWAY PHASE
ENVELOPE DETECTION
REC Ⓗ/P.B Ⓜ/MEMORY Ⓛ
FROM SYSTEM CONTROL
REV/STOP/FWD IN
VCC
R6561
SLOW TRACKING
FRONT PANEL
CTL PULSE
V-REF
FRAME ADVANCE Ⓗ
REV Ⓗ /STOP Ⓜ /FWD Ⓛ
HEAD SW
FG AMP 1
BIAS
FG AMP 2
SCHMITT CIRCUIT
HEAD AMP SELECTION
MODE DECORDER
CAPSTAN R/S/F SELECTION
A-V-SYNC MM 1
A-V-SYNC MM 2
A-V-SYNC MM 3
V.PULSE AMP
SLOW TRAKING MM
V-ROLL COMPENSATION
H-SWAY COMPENSATION
ACCEL
DECEL
CAPSTAN DRIVE IN SLOW MODE
CURRENT LIMIT
FULL TORQUE
D2206
D2204
D2203
Q2201
REFERENCE VOLTAGE: 2.7V
ARTIFICIAL H GATE PULSE (TO VIDEO CIRCUIT)
ARTIFICIAL V-SYNC (TO VIDEO CIRCUIT)
R2505
MOTOR COMMON
MOTOR SATURATION DETECT
TORQUE CONTROL
DIFFERENTIAL AMP
PG PULSE GENERATOR
POSITION SIGNAL PROCESS
FG PULSE GENERATOR
H/M/L CONVERTER
IC2502 ①②㉓ 11Vp-p 150Hz
HEM
HES
HALL IC
DD CYLIN
CAP. F.B
CAP. POWER
Q2502
IC2505 ①③㉓
1.0Vp-p
TO CAP. MOTOR
MOTOR ROTATION DIRECTION
RIPPLE CANCELLER
TO CAP. HALL IC
H3⁻
H3⁺
H2⁻
H2⁺
H1⁻
H1⁺
DD CAPST
CYLINDER PHASE LOOP.
CAPSTAN PHASE LOOP.
CYLINDER SPEED LOOP.
CAPSTAN SPEED LOOP.


B.P.M
REC 5Vp-p 8.6KHz
R2006 C2012
L.P.F
TP2003
CYLINDER POWER 5.5V
P205 13
IC2502 ⑪⑫㉓ 11Vp-p 150Hz
DER SPEED CONTROLLER
DIGITAL TRAPEZOID GENERATOR
LATCH PULSE GENERATOR
R2007 C2013
IC2002
CYLINDER ERROR VOLTAGE
P202 5
DS21 5
NORMAL: 2.55V
NORMAL: DC 2.5V (SPEED DOWN → VOLTAGE DOWN) (SPEED UP → VOLTAGE UP)
REC 5Vp-p 17.3KHz
CTL PG/FG
P202 16
DS21 16
R2505
MOTOR COMMON
MOTOR SATURATION DETECT
TORQUE CONTROL
DIFFERENTIAL AMP
PG PULSE GENERATOR
POSITION SIGNAL PROCESS
FG PULSE GENERATOR
H/M/L CONVERTER
M.M
+9V
CYL PG/FG
CYL PG 25Hz
CYL FG 150Hz
IC2502 AN3810K
FJ23 11
FJ23 12
FJ23 9
FJ23 7
FJ23 3
FJ23 5
FJ23 2
FJ23 4
HEM
HES
HALL IC
DD CYLINDER MOTOR
VR2001 +5V
PG SHIFTER
TP2004
REF VOLTAGE
IC2003
Q2002 (MOTOR START)
1/3
FG
PG
REC/PLAY 5Vp-p 8.6KHz
R2005 C2011
R2008 C2014
NORMAL: DC 2.5V (SPEED UP → VOLTAGE UP) (SPEED DOWN → VOLTAGE DOWN)
REC/PLAY 5Vp-p 17.3KHz
CAPSTAN SPEED CONTROLLER
TP2015
BUFFER
AMP
CAP. F.B
DS22 16
CAP. POWER
DS22 15
Q2502
IC2502 - ⑲
40msec
6.7msec
5V 2.5V 0V
CYL PG
CYL FG
CAPSTAN ERROR VOLTAGE
NORMAL: 2.47V
CUE: 2.42V
REV: 2.94V
PLAY 0.9Vp-p/770Hz
FJ24 12 CAPSTAN FG 1
FJ24 10 CAPSTAN FG 2
CAP ERROR VOLTAGE
P202 7
DS21 7
+B
R2028
R2013
R2029
SLOW FREE RUN
P201 12
DS22 12
DS21 6
P202 6
SCHMITT CIRCUIT
+5V
R2210
V.LOCK
TP2501
IC2003 - ⑧ 0.75Vp-p PLAY 770Hz CUE 5.4KHz REV 5.4KHz
SØ
FJ22 3
MOTOR ROTATION DIRECTION
RIPPLE CANCELLER
POSITION SIGNAL PROCESS
IC2505 AN3821K
IC2505 ①③㉓ 1.0Vp-p
TO CAP. MOTOR
FJ24 9
FJ24 2
FJ24 1
TO CAP. HALL IC
FJ24 4
FJ24 6
FJ24 1
FJ24 3
FJ24 11
FJ24 13
H3⁻
H3⁺
H2⁻
H2⁺
H1⁻
H1⁺
DD CAPSTAN MOTOR
BIAS
V.PULSE AMP
DRIVE MODE
FULL TORQUE
DS23 12
ARTIFICIAL H GATE PULSE (TO VIDEO CIRCUIT)
DS23 11
ARTIFICIAL V-SYNC (TO VIDEO CIRCUIT)
Q2201
REFERENCE VOLTAGE: 2.7V
CYLINDER PHASE LOOP.
CAPSTAN PHASE LOOP.
CYLINDER SPEED LOOP.
CAPSTAN SPEED LOOP.

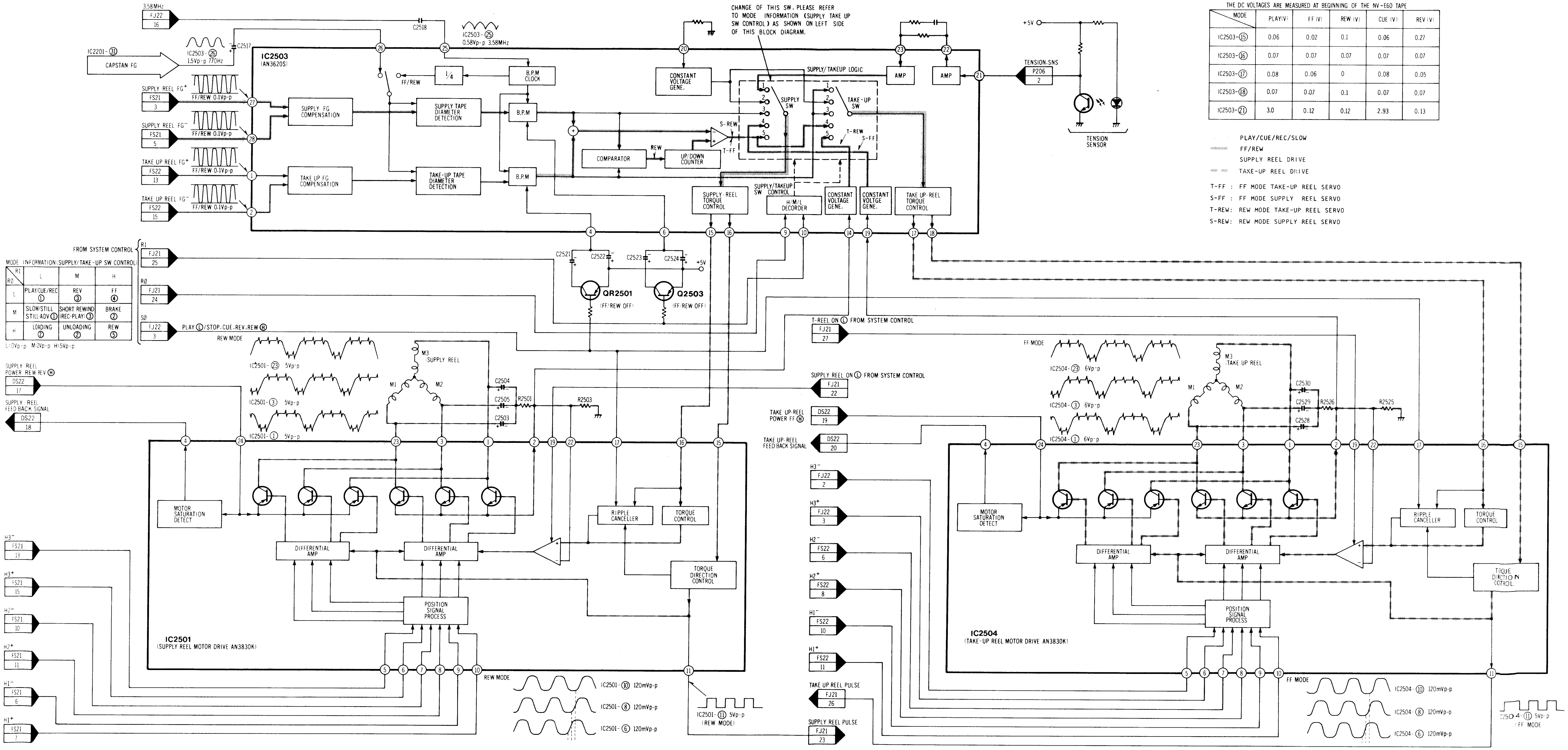
SLOW MODE TIMING CHART


HEAD SW PULSE IC2201 - 40
F - ADV PULSE IC2201 - 39
START MMV (DIGITAL MMV)
CAPSTAN MOTOR ON (L) (DIGITAL MMV)
FULL TORQUE IC2201 - 24
CONTROL PULSE IC2201 - 37
SLOW TRACKING MMV IC2201 - 38
CAPSTAN MOTOR BRAKE IC2201 - 21
CAPSTAN FG IN IC2201 - 29
ROTATION DIRECTION FORWARD (L)
DELAY MMV
REV/STOP/FWD OUT IC2201 - 6
CAPSTAN MOTOR CURRENT
HEAD AMP SW IC2201 - 7
CHROMA ROTATION IC2201 - 8
V - JITTER IC2201 - 11
12.6msec
4.9msec
9.5msec
2.7msec

ARTIFICIAL V-SYNC SIGNAL TIMING CHART


[SLOW MODE]
HEAD SW PULSE IC2201 - 40
M M 1 IC2201 - 13
M M 3 IC2201 - 16
V - PULSE IC2201 - 17
V - LOCK IC2201 - 18
[CUE or REV MODE]
HEAD SW PULSE IC2201 - 40
M M 1 IC2201 - 13
M M 2 IC2201 - 14
M M 3 IC2201 - 16
V - PULSE IC2201 - 17
V - LOCK IC2201 - 18

3-4. REEL SERVO BLOCK DIAGRAM



3.58MHz
FJ22 16
C2518
IC2503-㉕ 0.58Vp-p 3.58MHz
IC2201-㉛
CAPSTAN FG
IC2503-㉖ 1.5Vp-p 770Hz
C2517
IC2503
(AN3620S)
SUPPLY REEL FG+
FS21 3
FF/REW 0.1Vp-p
SUPPLY REEL FG−
FS21 5
TAKE UP REEL FG+
FS22 13
TAKE UP REEL FG−
FS22 15
SUPPLY FG COMPENSATION
TAKE UP FG COMPENSATION
SUPPLY TAPE DIAMETER DETECTION
TAKE-UP TAPE DIAMETER DETECTION
FF/REW
1/4
B.P.M CLOCK
B.P.M
COMPARATOR
REW
UP/DOWN COUNTER
S-REW
T-FF
CONSTANT VOLTAGE GENE.
SUPPLY/TAKEUP LOGIC
SUPPLY SW
TAKE-UP SW
T-REW
S-FF
SUPPLY/TAKEUP SW CONTROL
SUPPLY-REEL TORQUE CONTROL
H/M/L DECORDER
CONSTANT VOLTAGE GENE.
CONSTANT VOLTGE GENE.
TAKE UP-REEL TORQUE CONTROL
AMP
AMP
+5V
TENSION.SNS
P206 2
TENSION SENSOR
C2521
C2522
C2523
C2524
+5V
QR2501
(FF/REW OFF)
Q2503
(FF/REW OFF)
FROM SYSTEM CONTROL
R1
FJ21 25
RØ
FJ21 24
SØ
FJ22 3
PLAY ①/STOP.CUE.REV.REW Ⓗ
REW MODE
SUPPLY REEL POWER REW REV Ⓗ
DS22 17
SUPPLY - REEL FEED BACK SIGNAL
DS22 18
IC2501-㉓ 5Vp-p
IC2501-③ 5Vp-p
IC2501-① 5Vp-p
M3 SUPPLY REEL
M1
M2
C2504
C2505
C2503
R2501
R2503
MOTOR SATURATION DETECT
DIFFERENTIAL AMP
DIFFERENTIAL AMP
RIPPLE CANCELLER
TORQUE CONTROL
TORQUE DIRECTION CONTROL
POSITION SIGNAL PROCESS
IC2501
(SUPPLY REEL MOTOR DRIVE AN3830K)
H3− FS21 13
H3+ FS21 15
H2− FS21 10
H2+ FS21 11
H1− FS21 6
H1+ FS21 7
REW MODE
IC2501-⑩ 120mVp-p
IC2501-⑧ 120mVp-p
IC2501-⑥ 120mVp-p
IC2501-⑪ 5Vp-p (REW MODE)
T-REEL ON ① FROM SYSTEM CONTROL
FJ21 27
SUPPLY REEL ON ① FROM SYSTEM CONTROL
FJ21 22
TAKE UP-REEL POWER FF Ⓗ
DS22 19
TAKE UP-REEL FEED BACK SIGNAL
DS22 20
H3− FJ22 2
H3+ FJ22 3
H2− FS22 6
H2+ FS22 8
H1− FS22 10
H1+ FS22 11
TAKE UP REEL PULSE
FJ21 26
SUPPLY REEL PULSE
FJ21 23
FF MODE
IC2504-㉓ 6Vp-p
IC2504-③ 6Vp-p
IC2504-① 6Vp-p
M3 TAKE UP REEL
M1
M2
C2530
C2529
C2528
R2526
R2525
MOTOR SATURATION DETECT
DIFFERENTIAL AMP
DIFFERENTIAL AMP
RIPPLE CANCELLER
TORQUE CONTROL
TORQUE DIRECTION CONTROL
POSITION SIGNAL PROCESS
IC2504
(TAKE-UP REEL MOTOR DRIVE AN3830K)
FF MODE
IC2504-⑩ 120mVp-p
IC2504-⑧ 120mVp-p
IC2504-⑥ 120mVp-p
IC2504-⑪ 5Vp-p FF MODE

CHANGE OF THIS SW. PLEASE REFER TO MODE INFORMATION (SUPPLY TAKE UP SW CONTROL) AS SHOWN ON LEFT SIDE OF THIS BLOCK DIAGRAM.

MODE INFORMATION (SUPPLY/TAKE-UP SW CONTROL)

RØ \ R1	L	M	H
L	PLAY/CUE/REC ①	REV ③	FF ④
M	SLOW/STILL STILL·ADV ①	SHORT REWIND (REC·PLAY) ③	BRAKE ②
H	LOADING ②	UNLOADING ②	REW ⑤

L:0Vp-p M:2Vp-p H:5Vp-p

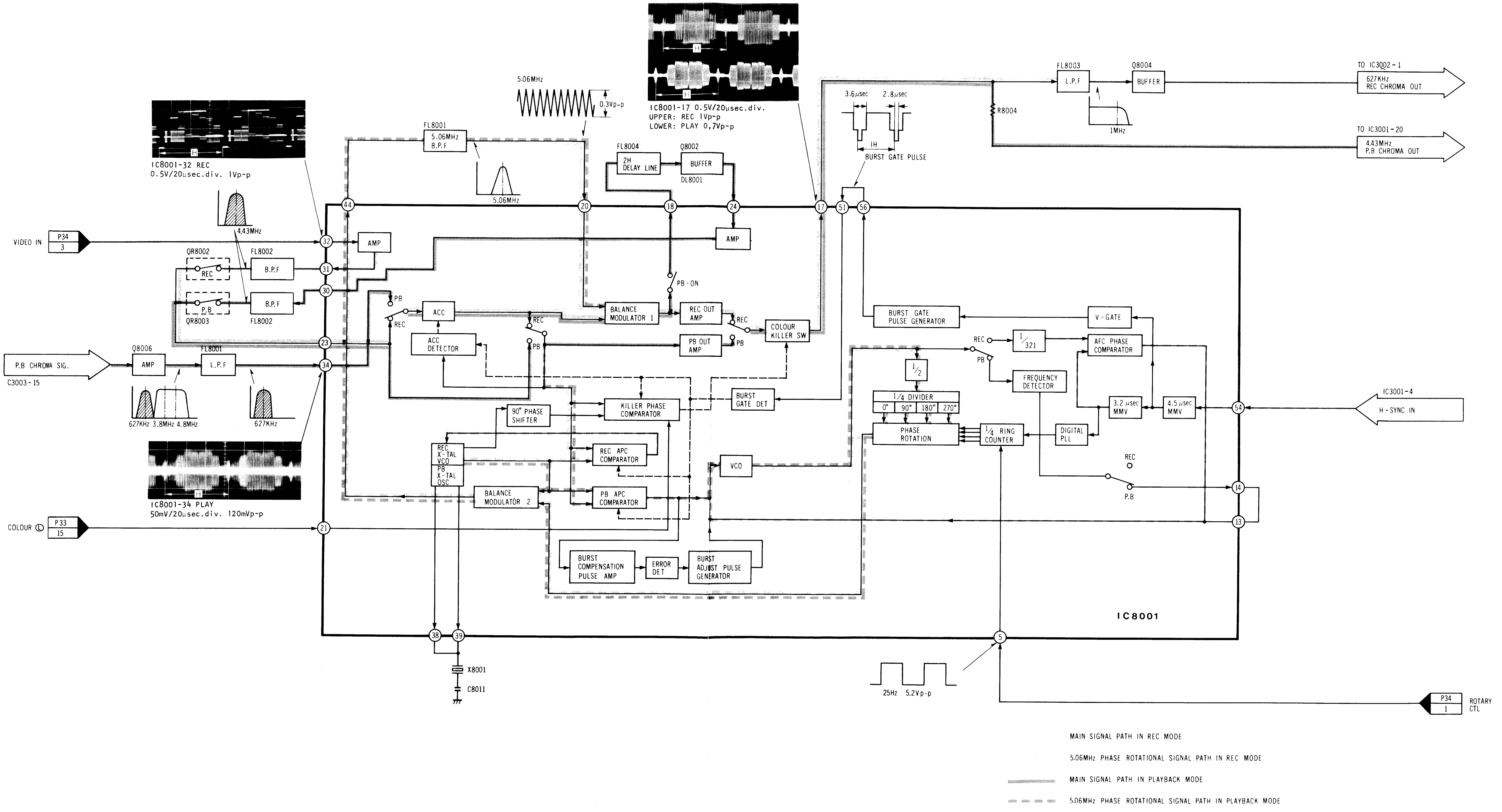
THE DC VOLTAGES ARE MEASURED AT BEGINNING OF THE NV-E60 TAPE

MODE	PLAY(V)	FF (V)	REW (V)	CUE (V)	REV (V)
IC2503-⑮	0.06	0.02	0.1	0.06	0.27
IC2503-⑯	0.07	0.07	0.07	0.07	0.07
IC2503-⑰	0.08	0.06	0	0.08	0.05
IC2503-⑱	0.07	0.07	0.1	0.07	0.07
IC2503-㉑	3.0	0.12	0.12	2.93	0.13

PLAY/CUE/REC/SLOW
FF/REW
SUPPLY REEL DRIVE
TAKE-UP REEL DRIVE

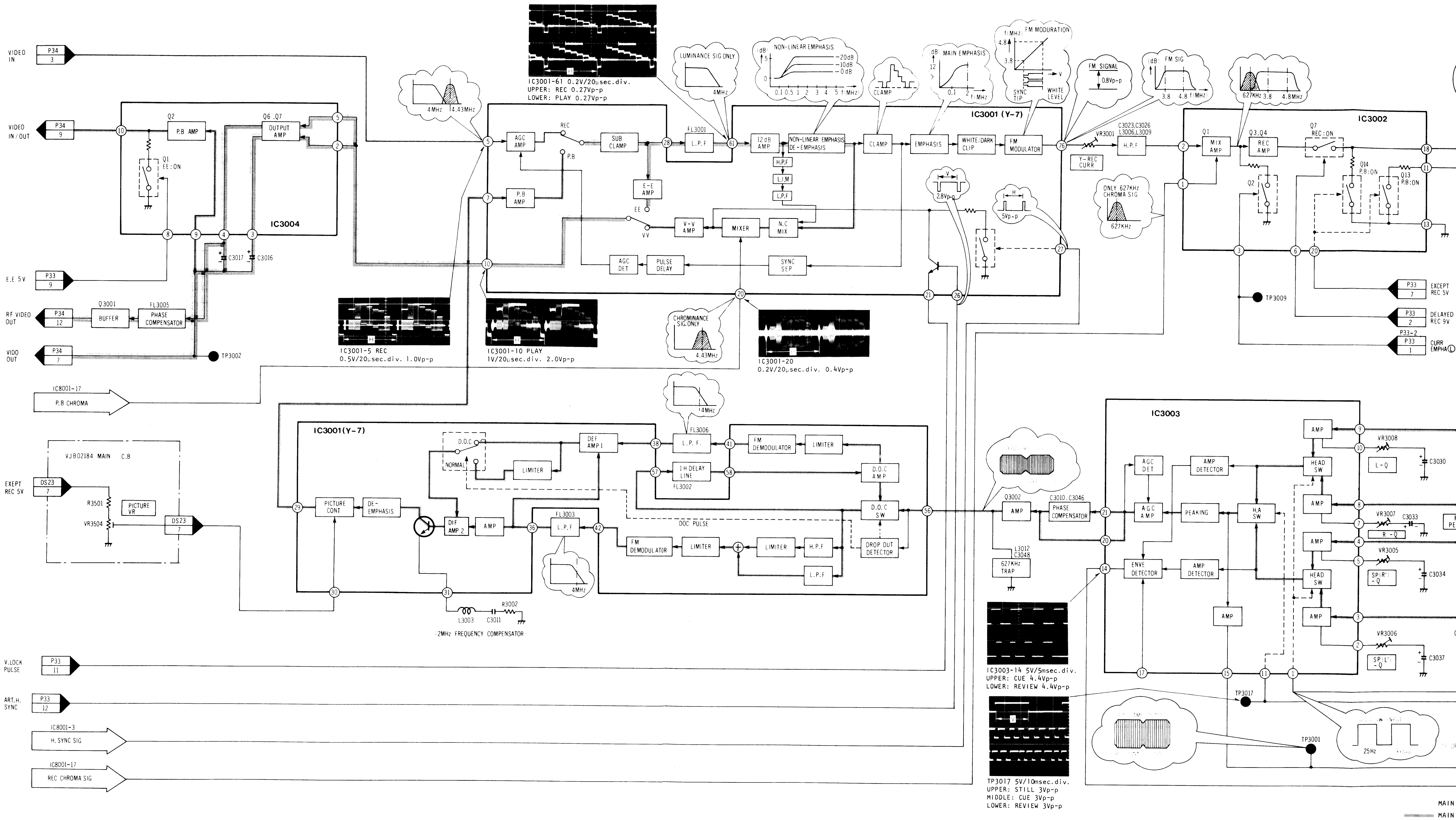
T-FF : FF MODE TAKE-UP REEL SERVO
S-FF : FF MODE SUPPLY REEL SERVO
T-REW: REW MODE TAKE-UP REEL SERVO
S-REW: REW MODE SUPPLY REEL SERVO

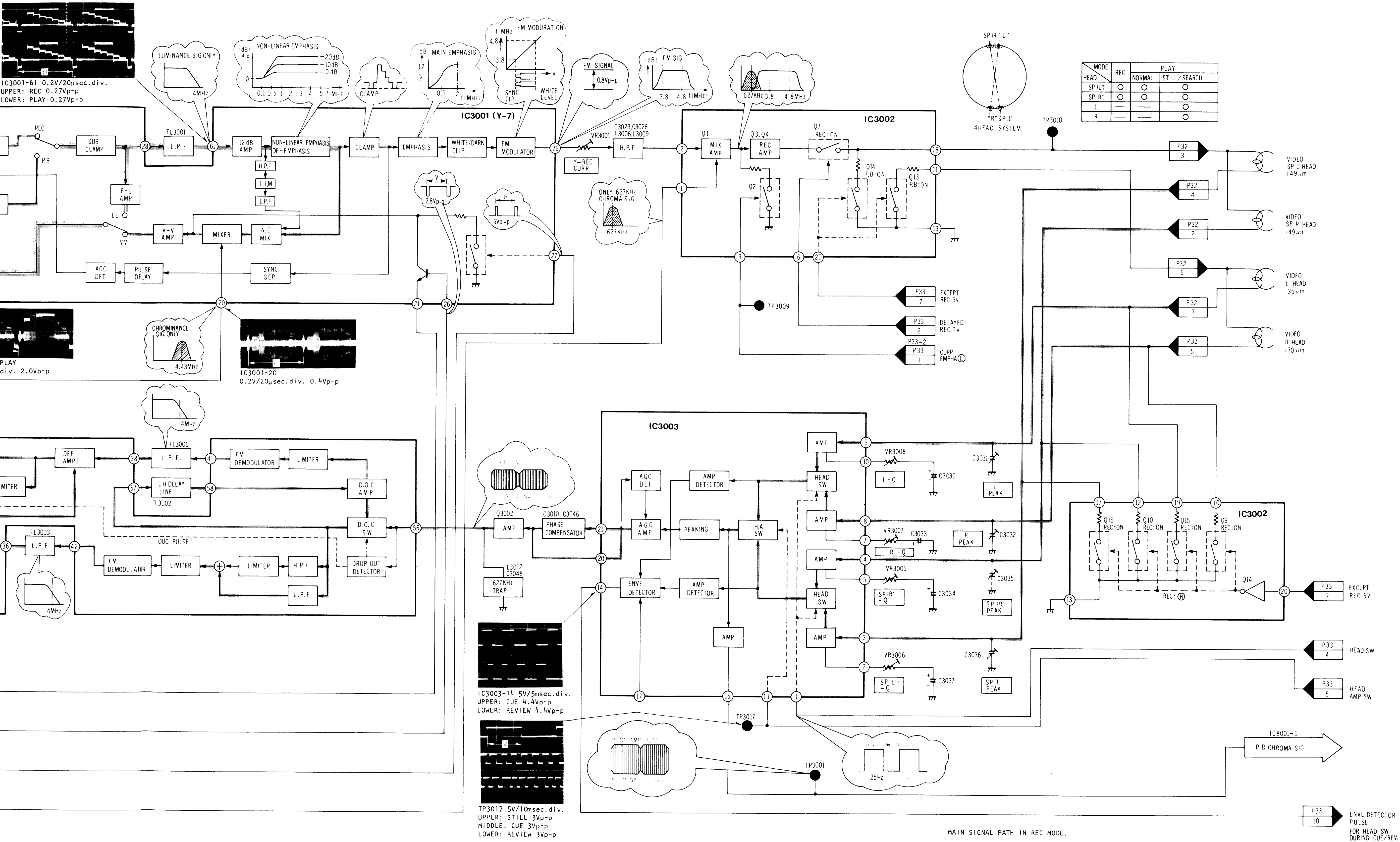
3-5. CHROMINANCE PROCESS BLOCK DIAGRAM


IC8001-32 REC
0.5V/20μsec.div. 1Vp-p
5.06MHz
0.3Vp-p
IC8001-17 0.5V/20μsec.div.
UPPER: REC 1Vp-p
LOWER: PLAY 0,7Vp-p
3.6μsec
2.8μsec
1H
BURST GATE PULSE
FL8003
L.P.F
Q8004
BUFFER
R8004
1MHz
TO IC3002-1
627KHz
REC CHROMA OUT
TO IC3001-20
4.43MHz
P.B CHROMA OUT
FL8001
5.06MHz
B.P.F
5.06MHz
FL8004
2H
DELAY LINE
Q8002
BUFFER
DL8001
4.43MHz
VIDEO IN
P34
3
QR8002
REC
FL8002
B.P.F
P.B
QR8003
AMP
PB-ON
PB
ACC
REC
ACC
DETECTOR
BALANCE
MODULATOR 1
REC OUT
AMP
PB OUT
AMP
COLOUR
KILLER SW
BURST GATE
PULSE GENERATOR
V-GATE
AFC PHASE
COMPARATOR
1/321
1/2
FREQUENCY
DETECTOR
1/4 DIVIDER
0°
90°
180°
270°
PHASE
ROTATION
1/4 RING
COUNTER
DIGITAL
PLL
3.2μsec
MMV
4.5μsec
MMV
IC3001-4
H-SYNC IN
P.B CHROMA SIG.
C3003-15
Q8006
AMP
FL8001
L.P.F
627KHz 3.8MHz 4.8MHz
627KHz
90° PHASE
SHIFTER
KILLER PHASE
COMPARATOR
BURST
GATE DET
REC APC
COMPARATOR
PB APC
COMPARATOR
REC
X-TAL
VCO
PB
X-TAL
OSC
VCO
BALANCE
MODULATOR 2
IC8001-34 PLAY
50mV/20μsec.div. 120mVp-p
COLOUR ⓛ
P33
15
BURST
COMPENSATION
PULSE AMP
ERROR
DET
BURST
ADJUST PULSE
GENERATOR
IC8001
44
20
18
24
17
51
56
32
31
30
23
34
21
54
14
13
38
39
5
X8001
C8011
25Hz 5.2Vp-p
P34
1
ROTARY
CTL
MAIN SIGNAL PATH IN REC MODE
5.06MHz PHASE ROTATIONAL SIGNAL PATH IN REC MODE
MAIN SIGNAL PATH IN PLAYBACK MODE
5.06MHz PHASE ROTATIONAL SIGNAL PATH IN PLAYBACK MODE

Back Page:
REEL SERVO Section

3-6. LUMINANCE PROCESS BLOCK DIAGRAM


VIDEO IN
P34 3
VIDEO IN/OUT
P34 9
E.E 5V
P33 9
RF VIDEO OUT
P34 12
VIDO OUT
P34 7
TP3002
Q2
P.B AMP
Q1 EE:ON
Q6, Q7
OUTPUT AMP
IC3004
C3017
C3016
Q3001
BUFFER
FL3005
PHASE COMPENSATOR
IC8001-17
P.B CHROMA
IC3001-61 0.2V/20μsec.div.
UPPER: REC 0.27Vp-p
LOWER: PLAY 0.27Vp-p
4MHz
4.43MHz
LUMINANCE SIG ONLY
AGC AMP
REC
P.B
SUB CLAMP
P.B AMP
E-E AMP
EE
VV
FL3001
L.P.F
V-V AMP
MIXER
N.C MIX
AGC DET
PULSE DELAY
SYNC SEP
IC3001 (Y-7)
NON-LINEAR EMPHASIS
-20dB
-10dB
-0dB
12dB AMP
NON-LINEAR EMPHASIS DE-EMPHASIS
H.P.F
L.I.M
L.P.F
CLAMP
MAIN EMPHASIS
EMPHASIS
WHITE/DARK CLIP
FM MODURATION
SYNC TIP
WHITE LEVEL
FM MODULATOR
FM SIGNAL
0.8Vp-p
2.8Vp-p
5Vp-p
IC3001-5 REC
0.5V/20μsec.div. 1.0Vp-p
IC3001-10 PLAY
1V/20μsec.div. 2.0Vp-p
CHROMINANCE SIG.ONLY
4.43MHz
IC3001-20
0.2V/20μsec.div. 0.4Vp-p
VR3001
C3023, C3026
L3006, L3009
H.P.F
Y-REC CURR
FM SIG
3.8
4.8 f(MHz)
ONLY 627KHz CHROMA SIG
627KHz
627KHz 3.8 4.8MHz
IC3002
Q1
MIX AMP
Q3, Q4
REC AMP
Q7 REC:ON
Q14 P.B:ON
Q13 P.B:ON
Q2
TP3009
P33 7 EXCEPT REC 5V
P33 2 DELAYED REC 9V
P33-2
P33 1 CURR EMPHA
VJB02184 MAIN C.B
EXEPT REC 5V
DS23 7
R3501
VR3504
PICTURE VR
IC3001(Y-7)
D.O.C
NORMAL
LIMITER
DEF AMP 1
FL3006
L.P.F.
1H DELAY LINE
FL3002
FM DEMODULATOR
D.O.C AMP
D.O.C SW
DOC PULSE
PICTURE CONT
DE-EMPHASIS
DIF AMP 2
AMP
FL3003
L.P.F
FM DEMODULATOR
LIMITER
H.P.F
L.P.F
DROP OUT DETECTOR
4MHz
L3003
C3011
R3002
(2MHz FREQUENCY COMPENSATOR)
Q3002
AMP
C3010, C3046
PHASE COMPENSATOR
L3012
C3048
627KHz TRAP
IC3003
AGC DET
AMP DETECTOR
AGC AMP
PEAKING
H.A SW
ENVE DETECTOR
AMP DETECTOR
AMP
HEAD SW
VR3008
L-Q
C3030
VR3007
C3033
R-Q
VR3005
SP(R') -Q
C3034
VR3006
SP(L') -Q
C3037
IC3003-14 5V/5msec.div.
UPPER: CUE 4.4Vp-p
LOWER: REVIEW 4.4Vp-p
TP3017
TP3001
25Hz
TP3017 5V/10msec.div.
UPPER: STILL 3Vp-p
MIDDLE: CUE 3Vp-p
LOWER: REVIEW 3Vp-p
V.LOCK PULSE
P33 11
ART.H. SYNC
P33 12
IC8001-3
H. SYNC SIG
IC8001-17
REC CHROMA SIG
MAIN
MAIN

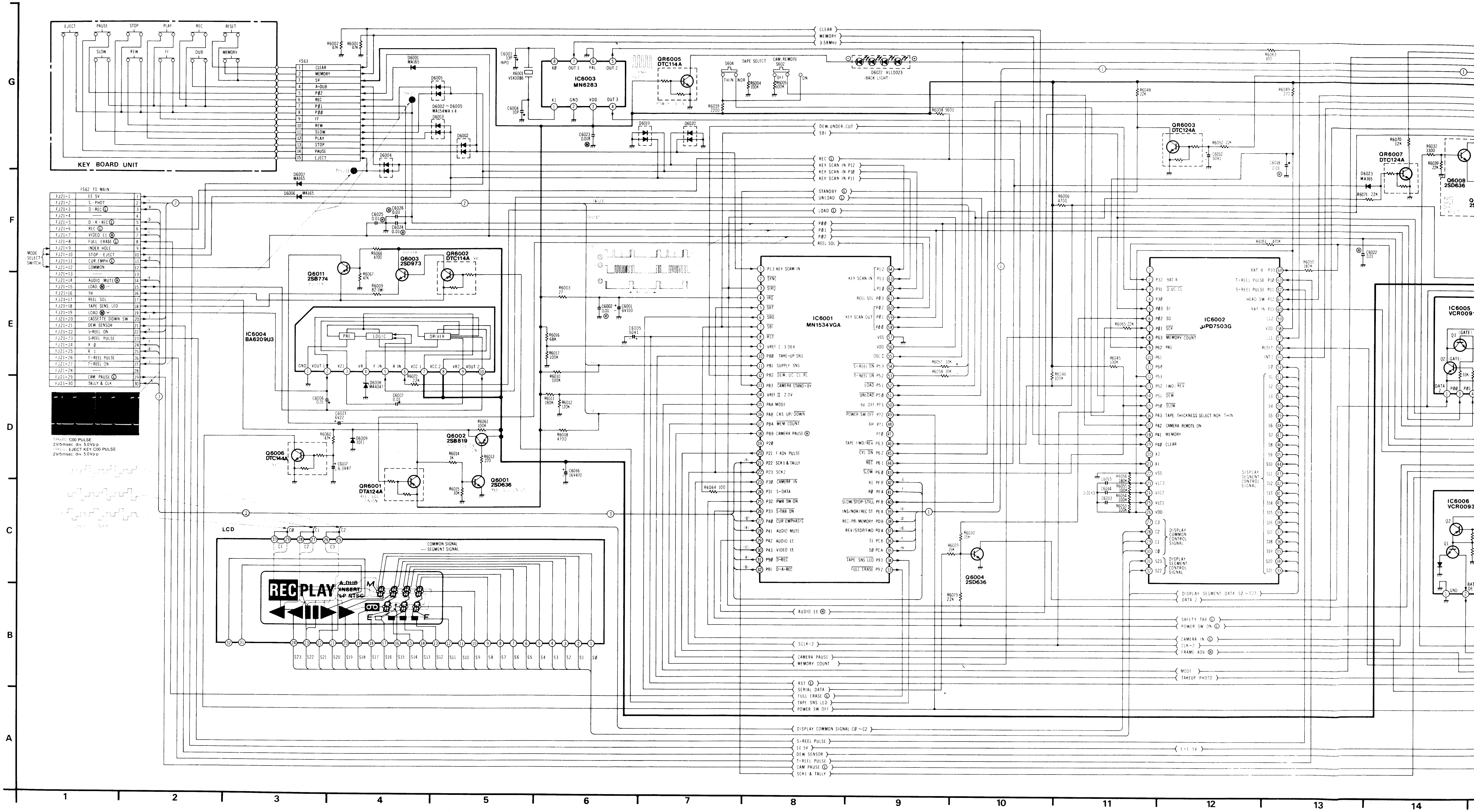

IC3001-61 0.2V/20μsec.div.
UPPER: REC 0.27Vp-p
LOWER: PLAY 0.27Vp-p
LUMINANCE SIG ONLY
4MHz
NON-LINEAR EMPHASIS
MAIN EMPHASIS
FM MODURATION
FM SIGNAL
0.8Vp-p
FM SIG
SYNC TIP
WHITE LEVEL
627KHz
3.8
4.8MHz
IC3001 (Y-7)
REC
P.B
SUB CLAMP
FL3001
L.P.F
12dB AMP
NON-LINEAR EMPHASIS DE-EMPHASIS
H.P.F
L.I.M
L.P.F
CLAMP
EMPHASIS
WHITE/DARK CLIP
FM MODULATOR
VR3001
Y-REC CURR
C3023,C3026 L3006,L3009
H.P.F
E-E AMP
EE
VV
V-V AMP
MIXER
N.C MIX
AGC DET
PULSE DELAY
SYNC SEP
2.8Vp-p
5Vp-p
ONLY 627KHz CHROMA SIG
627KHz
IC3002
Q1
MIX AMP
Q3,Q4
REC AMP
Q7
REC:ON
Q2
Q14
P.B:ON
Q13
P.B:ON
TP3009
TP3010
SP(R)"L"
"R"SP(L)
4HEAD SYSTEM
P32 3
P32 4
P32 2
P32 6
P32 7
P32 5
VIDEO SP L' HEAD (49μm)
VIDEO SP R' HEAD (49μm)
VIDEO L HEAD (35μm)
VIDEO R HEAD (30μm)
P33 7 EXCEPT REC 5V
P33 2 DELAYED REC 9V
P33-2
P33 1 CURR EMPHA(L)
CHROMINANCE SIG.ONLY
4.43MHz
PLAY
div. 2.0Vp-p
IC3001-20
0.2V/20μsec.div. 0.4Vp-p
4MHz
FL3006
L.P.F.
DEF AMP I
FM DEMODULATOR
LIMITER
MITER
1H DELAY LINE
FL3002
D.O.C AMP
D.O.C SW
DOC PULSE
FL3003
L.P.F
4MHz
FM DEMODULATOR
LIMITER
LIMITER
H.P.F
L.P.F
DROP OUT DETECTOR
Q3002
AMP
C3010,C3046
PHASE COMPENSATOR
L3012 C3048
627KHz TRAP
IC3003
AGC DET
AMP DETECTOR
AGC AMP
PEAKING
H.A SW
ENVE DETECTOR
AMP DETECTOR
AMP
HEAD SW
VR3008
L-Q
C3030
C3031
L PEAK
VR3007
C3033
R-Q
R PEAK
C3032
VR3005
SP(R') -Q
C3034
C3035
SP(R') PEAK
VR3006
C3036
SP(L') -Q
C3037
SP(L') PEAK
IC3002
Q16 REC:ON
Q10 REC:ON
Q15 REC:ON
Q9 REC:ON
Q14
REC:(H)
P33 7 EXCEPT REC 5V
P33 4 HEAD SW
P33 5 HEAD AMP SW
IC3003-14 5V/5msec.div.
UPPER: CUE 4.4Vp-p
LOWER: REVIEW 4.4Vp-p
TP3017
TP3001
25Hz
IC8001-1
P.B CHROMA SIG
TP3017 5V/10msec.div.
UPPER: STILL 3Vp-p
MIDDLE: CUE 3Vp-p
LOWER: REVIEW 3Vp-p
P33 10 ENVE DETECTOR PULSE FOR HEAD SW DURING CUE/REV.

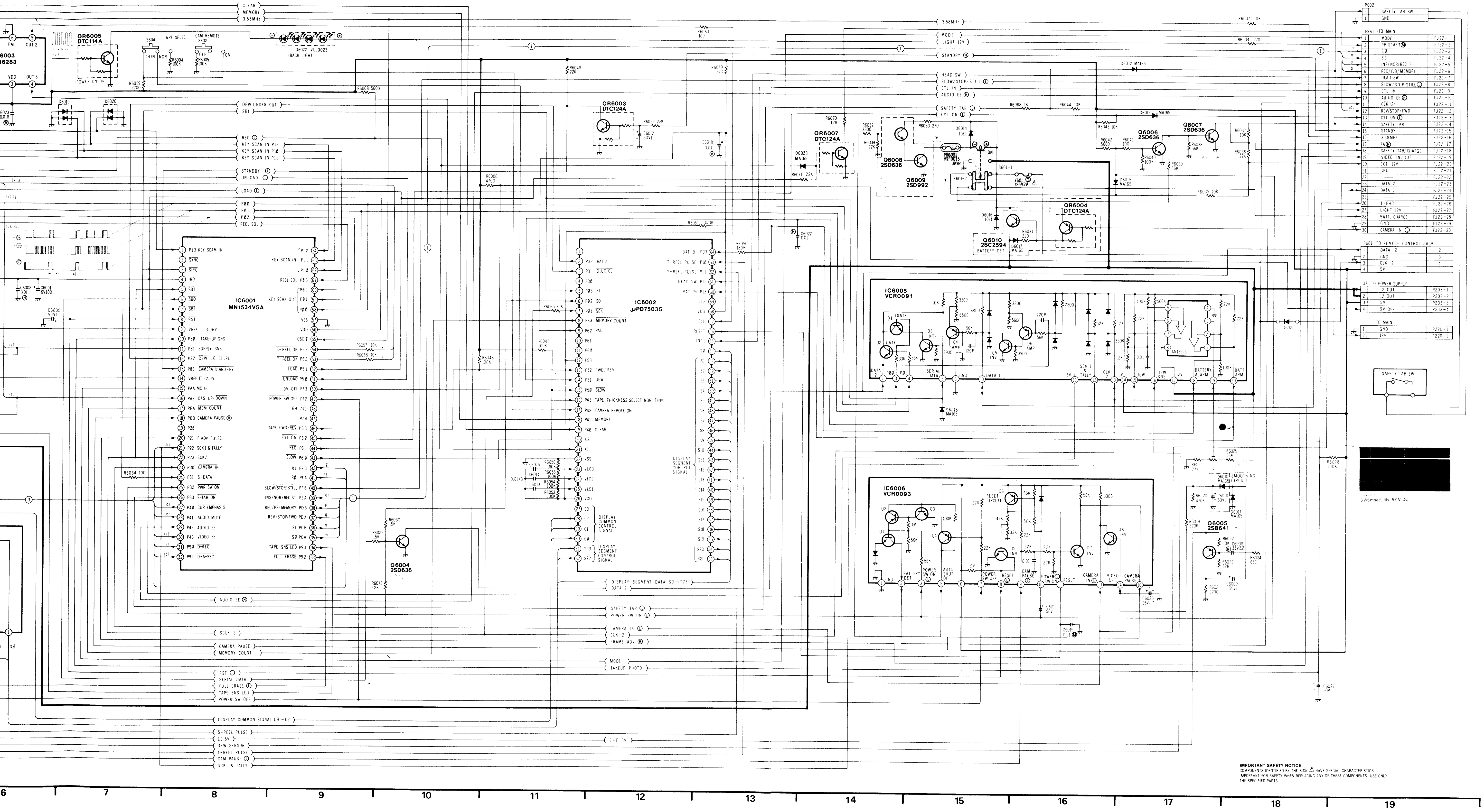
MODE / HEAD	REC	PLAY NORMAL	PLAY STILL/SEARCH
SP(L')	○	○	○
SP(R')	○	○	○
L	—	—	○
R	—	—	○

MAIN SIGNAL PATH IN REC MODE.
MAIN SIGNAL PATH IN PLAYBACK MODE.

Next Page:
SYSTEM CONTROL Section

3-7. SYSTEM CONTROL SCHEMATIC DIAGRAM


KEY BOARD UNIT
EJECT
PAUSE
STOP
PLAY
REC
RESET
SLOW
REW
FF
DUB
MEMORY
FS63
FS62 TO MAIN
MODE SELECT SWITCH
IC6003 MN6283
QR6005 DTC114A
S604 TAPE SELECT
S602 CAM. REMOTE
D6022 VLL0023 BACK LIGHT
IC6001 MN1534VGA
IC6002 µPD7503G
IC6004 BA6209U3
Q6011 2SB774
Q6003 2SD973
QR6002 DTC114A
Q6006 DTC144A
Q6002 2SB819
QR6001 DTA124A
Q6001 2SD636
Q6004 2SD636
QR6003 DTC124A
QR6007 DTC124A
Q6008 2SD636
IC6005 VCR009
IC6006 VCR0093
LCD
COMMON SIGNAL
SEGMENT SIGNAL
C00 PULSE 2V/5msec. div. 5.0Vp-p
EJECT KEY C00 PULSE 2V/5msec. div. 5.0Vp-p
G
F
E
D
C
B
A
1
2
3
4
5
6
7
8
9
10
11
12
13
14

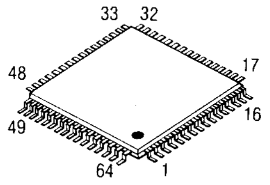

QR6005 DTC114A
POWER ON/ON
TAPE SELECT S604 THIN NOR
CAM. REMOTE S602 OFF ON
D6022 VLL0023 (BACK LIGHT)
D6019
D6020
CLEAR
MEMORY
3.58MHz
DEW, UNDER, CUT
SBI
REC Ⓛ
KEY SCAN IN P12
KEY SCAN IN P10
KEY SCAN IN P11
STANDBY Ⓛ
UNLOAD Ⓛ
LOAD Ⓛ
P00
P01
P02
REEL SOL
IC6001 MN1534VGA
IC6002 μPD7503G
QR6003 DTC124A
QR6007 DTC124A
Q6008 2SD636
Q6009 2SD992
Q6006 2SD636
Q6007 2SD636
QR6004 DTC124A
Q6010 2SC2594
BATTERY DET
Q6004 2SD636
MODE
LIGHT 12V
STANDBY Ⓗ
HEAD SW
SLOW/STOP/STILL Ⓛ
CTL IN
AUDIO EE Ⓗ
SAFETY TAB Ⓛ
CYL ON Ⓛ
IC6005 VCR0091
IC6006 VCR0093
Q6005 2SB641
SMOOTHING CIRCUIT
RESET CIRCUIT
P602
2 SAFETY TAB SW
1 GND
FS61 (TO MAIN)
1 MODE FJ22-
2 PB START Ⓜ FJ22-2
3 S0 FJ22-3
4 S1 FJ22-4
5 INS/NOR/REC S FJ22-5
6 REC/P.B/MEMORY FJ22-6
7 HEAD SW FJ22-7
8 SLOW/STOP/STILL Ⓛ FJ22-8
9 CTL IN FJ22-9
10 AUDIO EE Ⓗ FJ22-10
11 CLK (2) FJ22-11
12 REV/STOP/FWD FJ22-12
13 CYL ON Ⓛ FJ22-13
14 SAFETY TAB FJ22-14
15 STANBY FJ22-15
16 3.58MHz FJ22-16
17 FA Ⓗ FJ22-17
18 SAFETY TAB/CHARGE FJ22-18
19 VIDEO IN/OUT FJ22-19
20 EXT 12V FJ22-20
21 GND FJ22-21
22 — FJ22-22
23 DATA 2 FJ22-23
24 DATA 1 FJ22-24
25 — FJ22-25
26 T-PHOT FJ22-26
27 LIGHT 12V FJ22-27
28 BATT. CHARGE FJ22-28
29 GND FJ22-29
30 CAMERA IN Ⓛ FJ22-30
P601 TO REMOTE CONTROL JACK
1 DATA (2) 2
2 GND 3
3 CLK 2 4
4 5V 5
JA TO POWER SUPPLY
1 12 OUT P203-1
2 12 OUT P203-2
3 5V P203-3
4 9V OFF P203-4
TO MAIN
1 GND P220-1
2 12V P220-2
SAFETY TAB SW
5V/5msec. div. 5.0V DC
AUDIO EE
SCLK 2
CAMERA PAUSE
MEMORY COUNT
RST Ⓛ
SERIAL DATA
FULL ERASE Ⓛ
TAPE SNS LED
POWER SW OFF
DISPLAY COMMON SIGNAL C0~C2
S-REEL PULSE
EE 5V
DEW SENSOR
T-REEL PULSE
CAM PAUSE Ⓛ
SCK1 & TALLY
DISPLAY SEGMENT DATA S0~S23
DATA 2
SAFETY TAB Ⓛ
POWER SW ON Ⓛ
CAMERA IN Ⓛ
CLK 2
FRAME ADV Ⓗ
MODE
TAKEUP PHOTO
E-E 5V
6
7
8
9
10
11
12
13
14
15
16
17
18
19

IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED BY THE SIGN ⚠ HAVE SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SPECIFIED PARTS

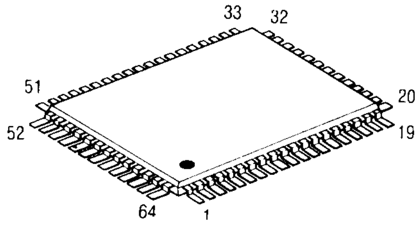
ICs & TRANSISTORs INFORMATION

SYSTEM CONTROL SCHEMATIC	
Transistor	
Q6001	C-5
Q6002	D-5
Q6003	F-4
Q6004	C-10
Q6005	C-17
Q6006	G-17
Q6007	G-17
Q6008	F-14
Q6009	F-14
Q6010	F-15
Q6011	E-3
Transistor & Resistor	
QR6001	C-4
QR6002	F-4
QR6003	G-11
QR6004	F-16
QR6005	G-7
QR6006	D-3
QR6007	G-14
Integrated Circuit	
IC6001	E-8
IC6002	E-12
IC6003	G-6
IC6004	E-3
IC6005	E-14
IC6006	C-14
Test Point	
TP6001	D-17
TP6002	G-4
TP6003	F-3
Adjustment	
VR6001	D-17
Connector	
FS61	H-19
FS62	F-1
FS63	G-3
JA	E-19
P601	F-19
P602	H-19

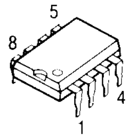
ADDRESS INFORMATION


33
32
48
17
16
49
64
1

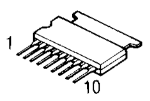
MN1534VGA


33
32
51
20
52
19
64
1

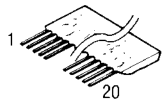
µPD7503G102



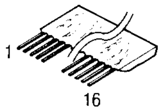
MN6283



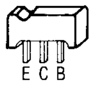
BA6209U3



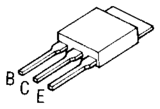
VCR6091



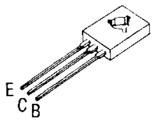
VCR0093



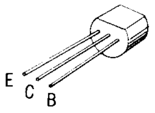
2SB641
2SB819
2SD636
2SD973



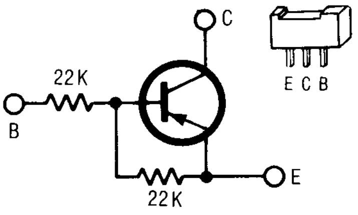
2SD992



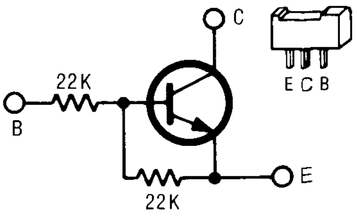
2SC2594



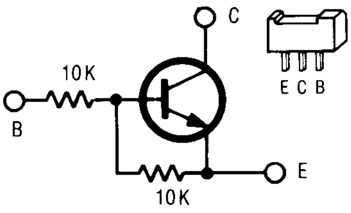
2SB774


C
22K
B
E
22K
E C B

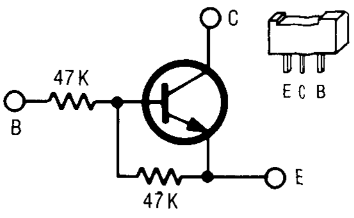
DTA124A


C
22K
B
E
22K
E C B

DTC124A


C
10K
B
E
10K
E C B

DTC114A


C
47K
B
E
47K
E C B

DTC144A

SYSTEM CONTROL ICs DC VOLTAGE CHART

REF. NO.	IC6001																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
STOP	5.0	4.0	5.0	5.0	4.7	0.2	4.6	0	0	0	5.1	5.1	5.2	2.1	0	0	5.1	0	0	0
PLAY	5.1	3.9	5.0	5.0	4.6	0.6	4.2	0	3.1	4.8	5.1	5.1	5.2	2.1	0	0	5.1	0	0	0
REC	5.1	3.9	5.1	5.1	4.6	0.3	4.2	5.1	0	5.1	5.1	5.1	5.2	2.1	0	0	5.1	0	0	0
F.F	5.0	4.0	5.0	5.0	4.6	0.4	4.3	5.1	3.1	0	5.1	5.1	5.2	2.1	0	0	5.1	0	0	0
REW	5.0	3.9	5.0	5.0	4.6	0.4	4.2	5.1	3.1	4.9	5.1	5.1	5.2	2.1	0	0	5.1	0	0	0

REF. NO.	IC6001																			
MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
STOP	5.0	4.7	4.2	4.6	0.6	2.1	5.0	0	5.0	5.0	9.6	9.3	9.6	9.6	4.8	0	2.1	5.0	2.1	0
PLAY	5.0	4.6	4.2	4.2	0.6	2.1	0	0	0	0	9.6	9.4	9.6	9.5	0	5.0	0	2.1	2.1	5.0
REC	5.1	4.7	4.2	3.9	0.6	2.1	5.0	0	5.0	5.0	0.1	0.2	0.1	9.5	0.1	5.0	0.1	5.0	0.1	5.0
F.F	5.0	4.6	4.2	4.2	0.6	2.1	5.0	0	5.0	5.0	9.1	9.2	9.2	0.1	4.9	0	2.1	5.0	2.1	0
REW	5.0	4.6	4.2	4.3	0.6	5.1	5.0	0	5.0	5.0	9.1	9.2	9.1	0.1	4.9	0	2.1	5.0	2.1	0

REF. NO.	IC6001																			
MODE	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
STOP	2.1	5.0	5.1	4.6	5.0	0	0	0	5.2	0	0	0	5.0	5.0	2.9	5.0	0	0.9	1.5	0.7
PLAY	0	0	5.1	5.0	0	5.1	0	0	5.2	0	0	0	0	0	2.9	5.0	0	0.9	1.5	0.7
REC	0.1	0.1	5.1	0.1	0	5.1	0	0	5.2	0	0	0	0	0	2.9	5.1	0	0.9	1.5	0.7
F.F	0	5.0	5.1	5.0	5.0	5.1	0	0	5.2	0	0	0	0	0	2.9	5.0	0	0.9	1.5	0.7
REW	5.0	5.0	5.1	5.0	5.0	0	0	0	5.2	0	0	0	0	0	2.9	5.0	0	0.9	1.5	0.7

REF. NO.	IC6001																			
MODE	61	62	63	64																
STOP	5.0	1.1	1.2	5.0																
PLAY	5.0	1.1	5.1	5.0																
REC	5.1	1.1	5.1	5.1																
F.F	5.0	1.1	1.1	5.0																
REW	5.0	1.1	1.1	5.0																

REF. NO.	IC6002																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
STOP	0	0.2	5.0	0	3.7	3.8	4.6	5.0	5.0	0	0	5.0	5.1	4.9	5.1	5.2	0	0	0	2.5
PLAY	0	0.2	5.1	0	4.3	2.0	4.6	5.0	5.1	0	0	5.1	5.1	4.9	5.1	5.2	0	0	0	2.5
REC	0	0.2	5.1	0	3.8	2.0	4.7	5.0	5.1	0	0	5.1	5.1	4.9	5.1	5.2	0	0	0	2.5
F.F	0	0.2	5.1	0	4.3	2.0	4.6	5.1	5.1	0	0	5.1	5.1	4.9	5.1	5.2	0	0	0	2.5
REW	0	0.2	5.1	0	4.3	2.0	4.6	5.1	5.1	0	0	5.1	0	4.9	5.1	5.2	0	0	0	2.5

REF. NO.	IC6002																			
MODE	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
STOP	2.6	0	2.1	3.0	4.0	5.0	0	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5
PLAY	2.6	0	2.1	3.1	4.1	5.1	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.7	3.6	3.6	3.6	3.6	3.6	3.6
REC	2.6	0	2.2	3.1	4.0	5.1	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
F.F	2.6	0	2.1	3.1	4.0	5.1	3.5	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
REW	2.6	0	2.1	3.1	4.0	5.1	3.5	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6

REF. NO.	IC6002																			
MODE	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
STOP	3.6	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.5	3.6	0.1	0	2.7	5.0	2.4	5.1
PLAY	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	2.3	0	2.7	5.1	2.4	5.1
REC	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	0	0	2.7	5.1	2.4	5.1
F.F	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.5	3.6	0	0	2.7	5.1	2.4	5.1
REW	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	0	0	2.7	5.1	2.4	5.1

REF. NO.	IC6002																			
MODE	61	62	63	64																
STOP	0	0.1	0.1	0																
PLAY	2.0	2.5	2.5	0.1																
REC	2.0	2.5	2.5	0.1																
F.F	3.9	2.6	2.6	0.1																
REW	3.9	2.6	2.6	0.1																

REF. NO.	IC6003										IC6004									
MODE	1	2	3	4	5	6	7	8			1	2	3	4	5	6	7	8	9	10
STOP	2.5	0	5.2	2.6	2.7	0	2.9	2.3			0	0.5	0.9	0.4	0	0	12.4	12.4	0.9	0.5
PLAY	2.5	0	5.2	2.6	2.7	0	2.9	2.3			0	0.6	0.9	0.4	0	0	12.3	12.3	0.9	0.6
REC	2.5	0	5.2	2.6	2.7	0	2.9	2.3			0	0.6	0.9	0.4	0	0	12.3	12.3	0.9	0.6
F.F	2.5	0	5.2	2.6	2.7	0	2.9	2.3			0	0.6	0.9	0.4	0	0	12.3	12.3	0.9	0.5
REW	2.5	0	5.2	2.6	2.7	0	2.9	2.3			0	0.5	0.9	0.4	0	0	12.3	12.3	0.9	0.5

REF. NO.	IC6005																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
STOP	4.6		0.9	1.5	4.2	0				4.6	5.0	5.0	4.7	5.2	4.9	0	12.4	3.8	3.9	5.1
PLAY	2.8		0.9	1.5	4.2	0				2.4	5.0	5.0	4.7	5.2	4.9	0	12.3	3.8	4.1	5.1
REC	4.6		0.9	1.5	4.2	0				2.4	5.0	5.0	4.7	5.2	4.9	0	12.3	3.8	4.0	5.1
F.F	2.9		0.9	1.5	4.2	0				2.9	5.0	5.0	4.6	5.2	4.9	0	12.3	3.8	3.9	5.0
REW	2.9		0.9	1.5	4.2	0				2.8	5.0	5.0	4.6	5.2	4.9	0	12.3	3.8	4.0	5.1

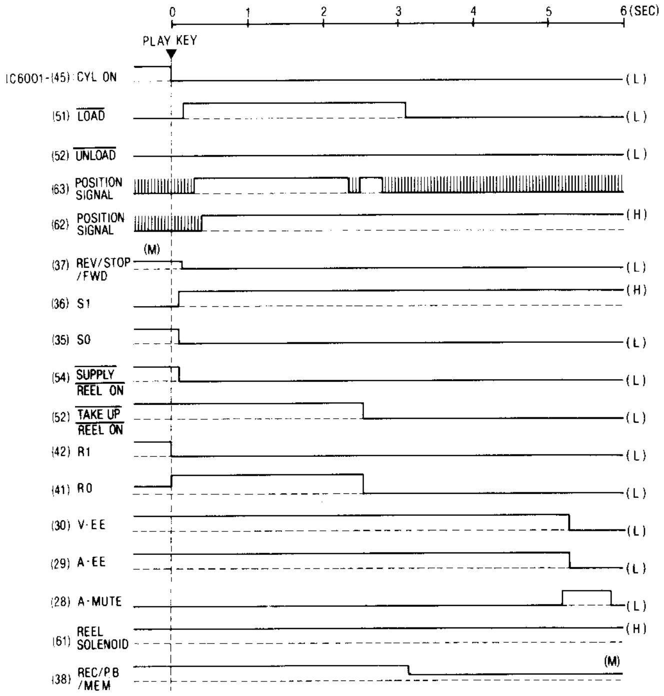
REF. NO.	IC6006																			
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16				
STOP	0	12.3	0.6		0	5.2	5.2	5.1	3.7	5.1	0		4.2	0		0				
PLAY	0	12.3	0.6		0	5.2	5.2	5.1	3.7	5.1	0		4.2	0		0				
REC	0	12.3	0.6		0	5.2	5.2	5.1	3.7	5.1	0		4.2	0		0				
F.F	0	12.3	0.6		0	5.2	5.2	5.1	3.7	5.1	0		4.2	0		0				
REW	0	12.3	0.6		0	5.2	5.2	5.1	3.7	5.1	0		4.2	0		0				

SYSTEM CONTROL TRANSISTORs DC VOLTAGE CHART

REF. NO.	Q6001			Q6002			Q6003			Q6004			Q6005			Q6006		
MODE	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
STOP	0	11.9	0	12.4	0	11.9	0	12.4	0	0	1.0	0.6	5.0	0.1	4.5	0	0	0.3
PLAY	0	11.8	0	12.3	0	11.8	0.1	12.3	0.1	0	3	0.3	0	0	0	0	0	0.3
REC	0	11.8	0	12.3	0	11.8	0.1	12.3	0.1	0	3	0.3	5.1	0.1	4.5	0	0	0.3
F.F	0	11.8	0	12.3	0	11.8	9.0	12.3	9.6	0	3	0.3	5.0	0.1	4.5	0	0	0.3
REW	0	11.8	0	12.3	0	11.8	9.0	12.3	9.6	0	3	0.3	5.0	0.2	4.5	0	0	0.3
REF. NO.	Q6007			Q6008			Q6009			Q6010			Q6011					
MODE	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
STOP	0	10.2	0	0	12.4	0	0	12.4	0	12.4	12.4	12.1	9.6	1.3	11.3			
PLAY	0	3.7	0	0	12.3	0	0	12.3	0	12.3	12.3	12.0	9.6	1.3	11.2			
REC	0	3.7	0	0	12.3	0	0	12.3	0	12.3	12.3	12.0	9.6	1.3	11.2			
F.F	0	10.2	0	0	12.3	0	0	12.3	0	12.3	12.3	12.0	9.6	1.3	11.2			
REW	0	10.2	0	0	12.3	0	0	12.3	0	12.3	12.3	12.0	9.6	1.3	11.2			
REF. NO.	QR6001			QR6002			QR6003			QR6004			QR6005			QR6006		
MODE	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
STOP	5.2	0	4.9	9.6	0	9.6	0	5.2	0	12.4	12.1	12.3	0	0.1	5.2	0	5.2	0
PLAY	5.2	0	5.0	9.6	0	9.5	0	5.2	0	12.3	12.0	12.3	0	0.1	5.2	0	5.2	0
REC	5.2	0	5.0	9.6	0.1	9.5	0	5.2	0	12.3	12.0	12.3	0	0.1	5.2	0	5.2	0
F.F	5.2	0	5.0	9.6	9.6	0.1	0	5.2	0	12.3	12.0	12.2	0	0.1	5.2	0	5.2	0
REW	5.2	0	5.0	9.6	9.6	0.1	0	5.2	0	12.3	12.0	12.2	0	0.1	5.2	0	5.2	0

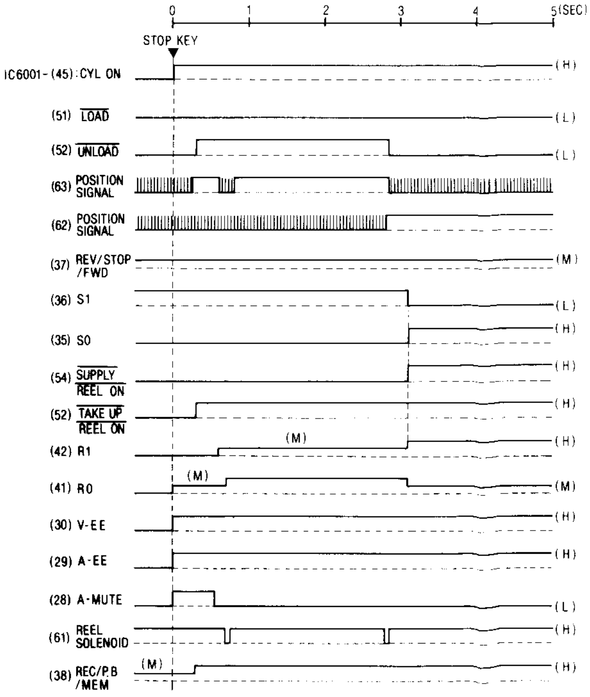
MICROPROCESSOR IC6001 (MN1534VGA) MODE BY MODE TIMING CHART

1. STOP → PLAY



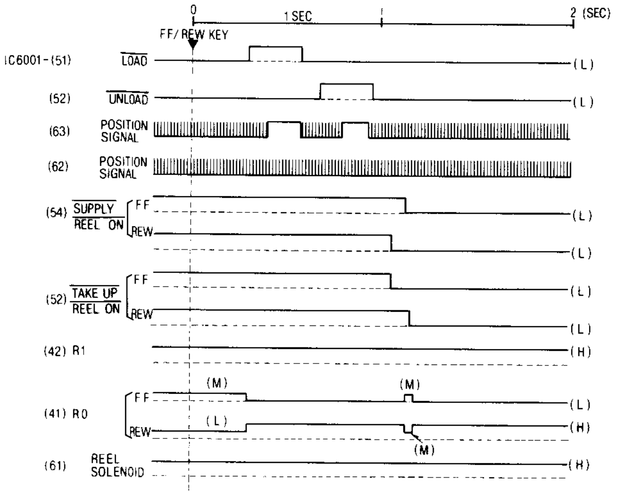
0
1
2
3
4
5
6(SEC)
PLAY KEY
IC6001-(45) CYL ON
(L)
(51) LOAD
(L)
(52) UNLOAD
(L)
(63) POSITION SIGNAL
(62) POSITION SIGNAL
(H)
(M)
(37) REV/STOP /FWD
(L)
(36) S1
(H)
(35) S0
(L)
(54) SUPPLY REEL ON
(L)
(52) TAKE UP REEL ON
(L)
(42) R1
(L)
(41) R0
(L)
(30) V-EE
(L)
(29) A-EE
(L)
(28) A-MUTE
(L)
(61) REEL SOLENOID
(H)
(38) REC/PB /MEM
(M)

2. PLAY → STOP

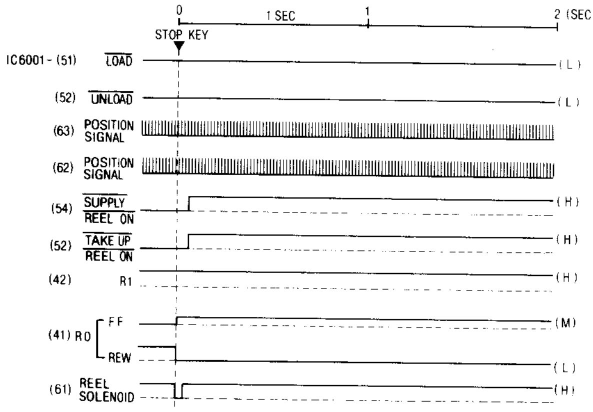


0
1
2
3
4
5(SEC)
STOP KEY
IC6001-(45) CYL ON
(H)
(51) LOAD
(L)
(52) UNLOAD
(L)
(63) POSITION SIGNAL
(62) POSITION SIGNAL
(37) REV/STOP /FWD
(M)
(36) S1
(L)
(35) S0
(H)
(54) SUPPLY REEL ON
(H)
(52) TAKE UP REEL ON
(H)
(M)
(42) R1
(H)
(M)
(41) R0
(M)
(30) V-EE
(H)
(29) A-EE
(H)
(28) A-MUTE
(L)
(61) REEL SOLENOID
(H)
(M)
(38) REC/PB /MEM
(H)

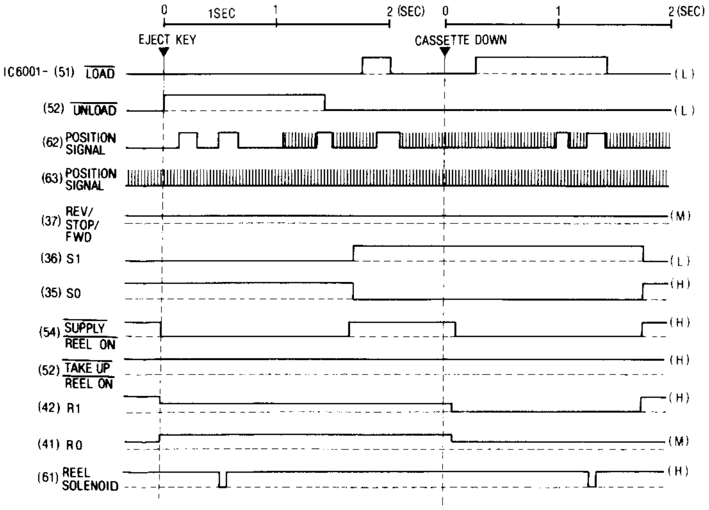
3. STOP → FF/REW


0
1 SEC
2 (SEC)
FF/REW KEY
IC6001-(51) LOAD
(52) UNLOAD
(63) POSITION SIGNAL
(62) POSITION SIGNAL
(54) SUPPLY REEL ON
FF
REW
(52) TAKE UP REEL ON
(42) R1
(41) R0
(M)
(L)
(H)
(61) REEL SOLENOID

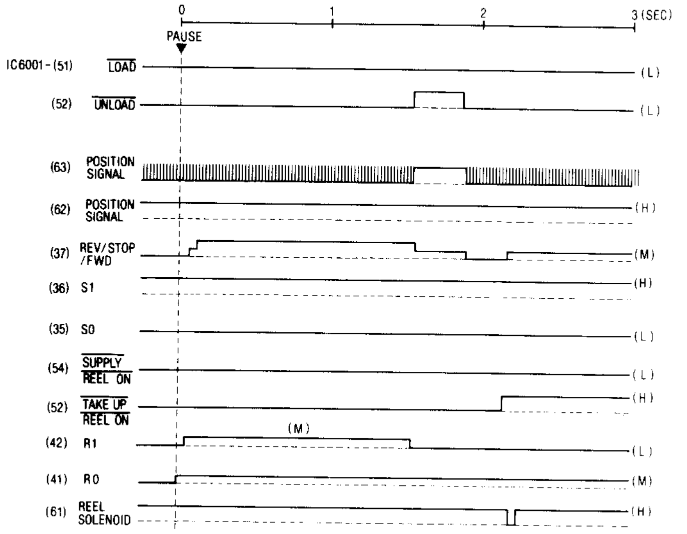
4. FF/REW → STOP


0
1 SEC
1
2 (SEC)
STOP KEY
IC6001-(51) LOAD
(52) UNLOAD
(63) POSITION SIGNAL
(62) POSITION SIGNAL
(54) SUPPLY REEL ON
(52) TAKE UP REEL ON
(42) R1
(41) R0
FF
REW
(61) REEL SOLENOID
(L)
(H)
(M)

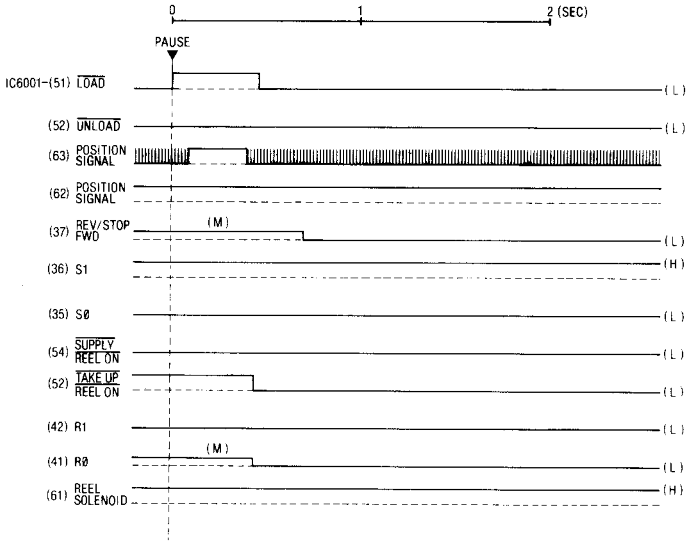
5. STOP → EJECT


0
1SEC
1
2 (SEC)
EJECT KEY
CASSETTE DOWN
IC6001-(51) LOAD
(52) UNLOAD
(62) POSITION SIGNAL
(63) POSITION SIGNAL
(37) REV/STOP/FWD
(36) S1
(35) S0
(54) SUPPLY REEL ON
(52) TAKE UP REEL ON
(42) R1
(41) R0
(61) REEL SOLENOID
(L)
(M)
(H)

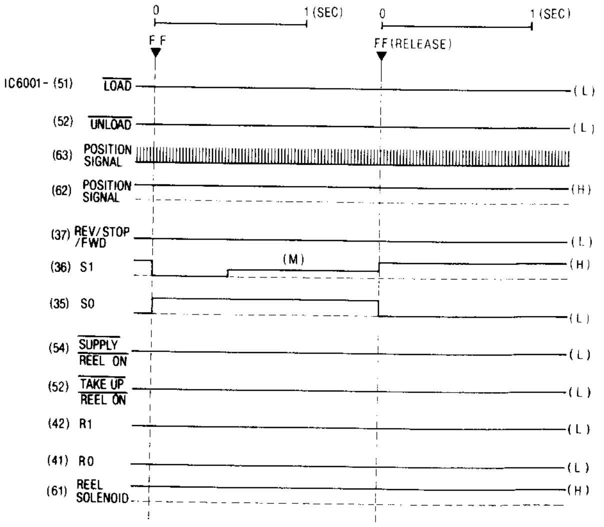
6. REC•PLAY → REC•PAUSE


0
1
2
3 (SEC)
PAUSE
IC6001-(51) LOAD
(52) UNLOAD
(63) POSITION SIGNAL
(62) POSITION SIGNAL
(37) REV/STOP /FWD
(36) S1
(35) S0
(54) SUPPLY REEL ON
(52) TAKE UP REEL ON
(42) R1
(41) R0
(61) REEL SOLENOID
(L)
(H)
(M)

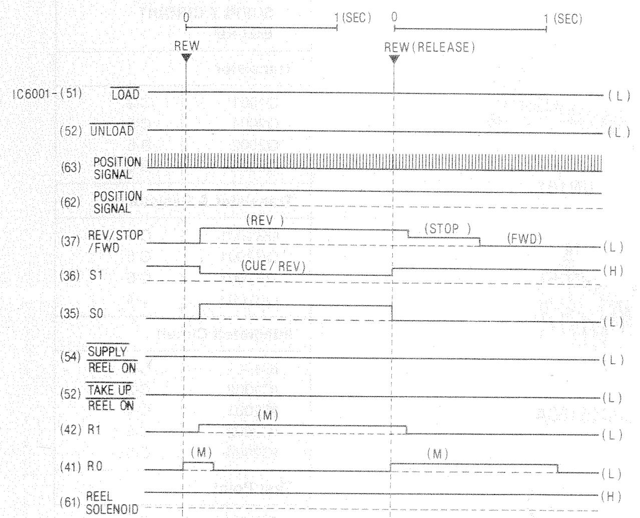
7. REC•PAUSE → REC•PLAY


0
1
2 (SEC)
PAUSE
IC6001-(51) LOAD
(52) UNLOAD
(63) POSITION SIGNAL
(62) POSITION SIGNAL
(37) REV/STOP FWD
(36) S1
(35) S0
(54) SUPPLY REEL ON
(52) TAKE UP REEL ON
(42) R1
(41) R0
(61) REEL SOLENOID
(M)
(L)
(H)

8. PLAY → CUE → PLAY


0
1 (SEC)
FF
FF (RELEASE)
IC6001-(51) LOAD
(52) UNLOAD
(63) POSITION SIGNAL
(62) POSITION SIGNAL
(37) REV/STOP /FWD
(36) S1
(35) S0
(54) SUPPLY REEL ON
(52) TAKE UP REEL ON
(42) R1
(41) R0
(61) REEL SOLENOID
(M)
(L)
(H)

9. PLAY → REVIEW → PLAY



3-8. SYSTEM CONTROL CIRCUIT BOARD (VEP06218A)

P602 (TO SAFETY TAB)

1	GND
2	SAFETY TAB SW

FS62 (TO MAIN)

1	EE 5V	16	9V
2	S-PHOTO	17	REEL SOL
3	D-REC Ⓛ	18	TAPE SENS LED
4	————	19	LOAD Ⓜ (+)
5	D-A-REC Ⓛ	20	CASSETE DOWN SW
6	REC Ⓛ	21	DEW SENSOR
7	VIDEO EE Ⓗ	22	S-REEL ON
8	FULL ERASE Ⓛ	23	S-REEL PULSE
9	INDEX HOLE	24	P0
10	STOP-EJECT	25	R1
11	CUR.EMPH Ⓛ	26	T-REEL PULSE
12	COMMON	27	T-REEL ON
13	————	28	————
14	AUDIO MUTE Ⓗ	29	CAM.PAUSE
15	LOAD Ⓜ (−)	30	TALLY & CLK

FS63

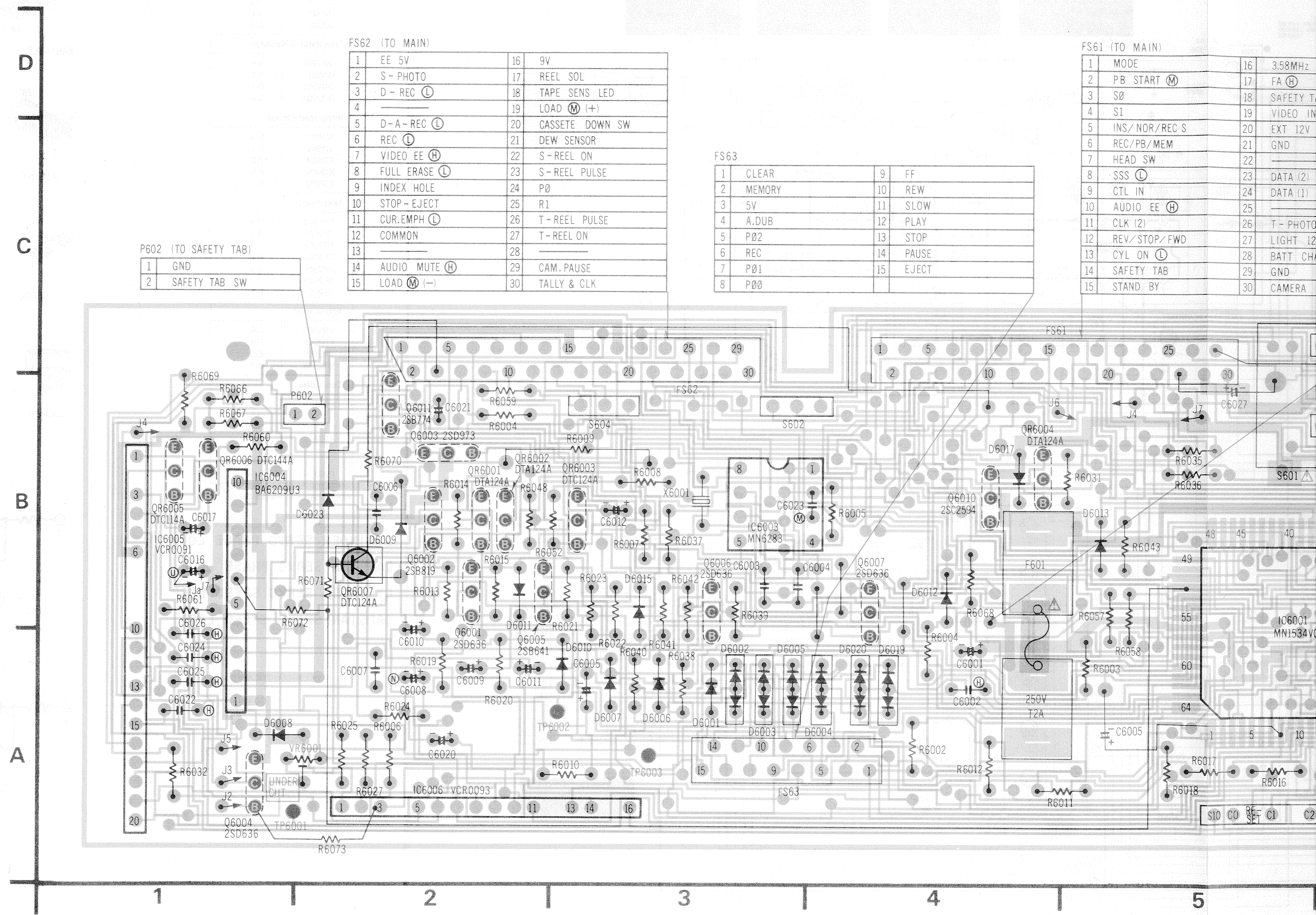
1	CLEAR	9	FF
2	MEMORY	10	REW
3	5V	11	SLOW
4	A.DUB	12	PLAY
5	P02	13	STOP
6	REC	14	PAUSE
7	P01	15	EJECT
8	P00		

FS61 (TO MAIN)

1	MODE	16	3.58MHz
2	PB START Ⓜ	17	FA Ⓗ
3	S0	18	SAFETY T
4	S1	19	VIDEO IN
5	INS/NOR/REC S	20	EXT 12V
6	REC/PB/MEM	21	GND
7	HEAD SW	22	————
8	SSS Ⓛ	23	DATA (2)
9	CTL IN	24	DATA (1)
10	AUDIO EE Ⓗ	25	————
11	CLK (2)	26	T-PHOTO
12	REV/STOP/FWD	27	LIGHT 12
13	CYL ON Ⓛ	28	BATT CH
14	SAFETY TAB	29	GND
15	STAND BY	30	CAMERA

SYSTEM CONTROL CIRCUIT BOARD	
Transistor	
Q6001	B-2
Q6002	B-2
Q6003	B-2
Q6004	A-1
Q6005	B-2
Q6006	B-3
Q6007	B-4
Q6008	B-7
Q6009	B-7
Q6010	B-4
Q6011	B-2
Transistor & Resistor	
QR6001	B-4
QR6002	B-2
QR6003	B-3
QR6004	B-4
QR6005	B-1
QR6006	B-1
QR6007	B-2
Integrated Circuit	
IC6001	B-5
IC6002	A-7
IC6003	B-3
IC6004	B-1
IC6005	B-1
IC6006	A-2
Test Point	
TP6001	A-2
TP6002	A-3
TP6003	A-3
Adjustment	
VR6001	A-2

ADDRESS INFORMATION


D
C
B
A
1
2
3
4
5
FS62
FS61
FS63
P602
S604
S602
S601
F601
250V T2A
J2
J3
J4
J5
J6
J7
IC6001 MN1534V
IC6003 MN6283
IC6004 BA6209U3
IC6005 VCR0091
IC6006 VCR0093
Q6001 2SD636
Q6002 2SB819
Q6003 2SD973
Q6004 2SD636
Q6005 2SB641
Q6006 2SD636
Q6007 2SD636
Q6010 2SC2594
Q6011 2SB774
QR6001 DTA124A
QR6002 DTA124A
QR6003 DTC124A
QR6004 DTA124A
QR6005 DTC114A
QR6006 DTC144A
QR6007 DTC124A
X6001
UNDER CUT
VR6001
TP6001
TP6002
TP6003
R6002
R6003
R6004
R6005
R6006
R6007
R6008
R6009
R6010
R6011
R6012
R6013
R6014
R6015
R6016
R6017
R6018
R6019
R6020
R6021
R6022
R6023
R6024
R6025
R6027
R6031
R6032
R6035
R6036
R6037
R6038
R6039
R6040
R6041
R6042
R6043
R6048
R6052
R6057
R6058
R6059
R6060
R6061
R6066
R6067
R6068
R6069
R6070
R6071
R6072
R6073
C6001
C6002
C6004
C6005
C6006
C6007
C6008
C6009
C6010
C6011
C6012
C6016
C6017
C6020
C6021
C6022
C6023
C6024
C6025
C6026
C6027
D6001
D6002
D6003
D6004
D6005
D6006
D6007
D6008
D6009
D6010
D6011
D6012
D6013
D6015
D6017
D6019
D6020
D6023
S10
CO
REC SET
C1
C2

L CIRCUIT BOARD (VEP06218A)

FS62 (TO MAIN)

1	EE 5V	16	9V
2	S - PHOTO	17	REEL SOL
3	D - REC Ⓛ	18	TAPE SENS LED
4	———	19	LOAD Ⓜ (+)
5	D-A-REC Ⓛ	20	CASSETE DOWN SW
6	REC Ⓛ	21	DEW SENSOR
7	VIDEO EE Ⓗ	22	S-REEL ON
8	FULL ERASE Ⓛ	23	S-REEL PULSE
9	INDEX HOLE	24	P0
10	STOP-EJECT	25	R1
11	CUR.EMPH Ⓛ	26	T-REEL PULSE
12	COMMON	27	T-REEL ON
13	———	28	———
14	AUDIO MUTE Ⓗ	29	CAM.PAUSE
15	LOAD Ⓜ (−)	30	TALLY & CLK

FS63

1	CLEAR	9	FF
2	MEMORY	10	REW
3	5V	11	SLOW
4	A.DUB	12	PLAY
5	P02	13	STOP
6	REC	14	PAUSE
7	P01	15	EJECT
8	P00		

FS61 (TO MAIN)

1	MODE	16	3.58MHz
2	PB START Ⓜ	17	FA Ⓗ
3	S0	18	SAFETY TAB/CHARGE
4	S1	19	VIDEO IN/OUT
5	INS/NOR/REC S	20	EXT 12V
6	REC/PB/MEM	21	GND
7	HEAD SW	22	———
8	SSS Ⓛ	23	DATA (2)
9	CTL IN	24	DATA (1)
10	AUDIO EE Ⓗ	25	———
11	CLK (2)	26	T - PHOTO
12	REV/STOP/FWD	27	LIGHT 12V
13	CYL ON Ⓛ	28	BATT CHARGE
14	SAFETY TAB	29	GND
15	STAND BY	30	CAMERA IN Ⓛ

P601 (TO REMOTE CONTROL JACK)

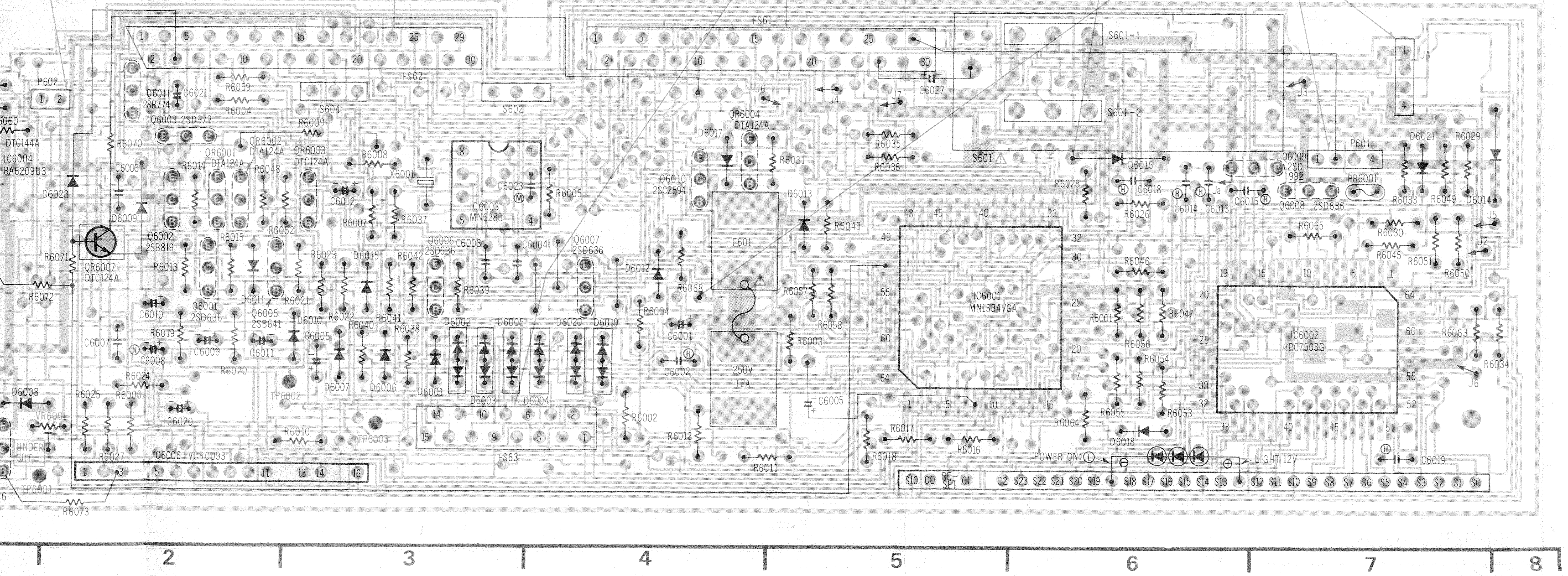
1	DATA (2)
2	GND
3	CLK (2)
4	5V

TO MAIN

1	GND
2	12V

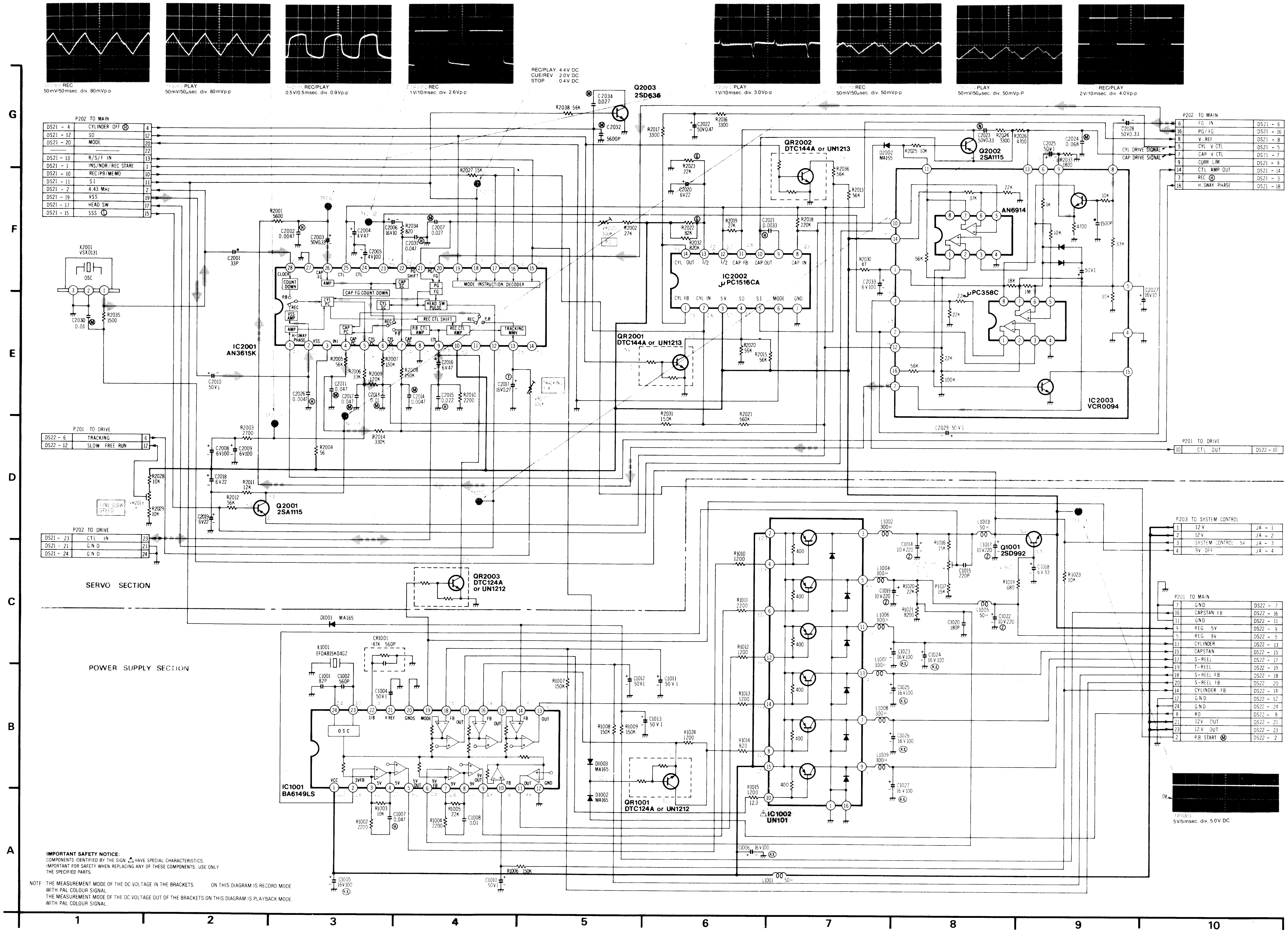
JA (TO POWER SUPPLY)

1	12V OUT
2	12V OUT
3	5V
4	9V OFF


FS62
FS61
FS63
P602
S604
S602
S601-1
S601-2
S601
JA
J2
J3
J4
J5
J6
J7
P601
PR6001
IC6001 MN1534VGA
IC6002 μPD7503G
IC6003 MN6283
IC6004 BA6209U3
IC6006 VCR0093
Q6001 2SD636
Q6002 2SB819
Q6003 2SD973
Q6005 2SB641
Q6006 2SD636
Q6007 2SD636
Q6008 2SD636
Q6009 2SD992
Q6010 2SC2594
Q6011 2SB774
QR6001 DTA124A
QR6002 DTA124A
QR6003 DTC124A
QR6004 DTA124A
QR6007 DTC124A
DTC144A
X6001
F601
250V T2A
TP6001
TP6002
TP6003
VR6001
UNDER CUT
POWER ON Ⓛ
LIGHT 12V
S10 C0 RESET C1 C2 S23 S22 S21 S20 S19 S18 S17 S16 S15 S14 S13 S12 S11 S10 S9 S8 S7 S6 S5 S4 S3 S2 S1 S0
D6001 D6002 D6003 D6004 D6005 D6006 D6007 D6008 D6009 D6010 D6011 D6012 D6013 D6014 D6015 D6017 D6018 D6019 D6020 D6021 D6023
C6001 C6002 C6003 C6004 C6005 C6006 C6007 C6008 C6009 C6010 C6011 C6012 C6013 C6014 C6015 C6018 C6019 C6020 C6021 C6023 C6027
R6001 R6002 R6003 R6004 R6005 R6006 R6007 R6008 R6009 R6011 R6012 R6013 R6014 R6015 R6016 R6017 R6018 R6019 R6020 R6021 R6022 R6023 R6024 R6025 R6026 R6027 R6028 R6029 R6030 R6031 R6033 R6034 R6035 R6036 R6037 R6038 R6039 R6040 R6041 R6042 R6043 R6045 R6046 R6047 R6048 R6049 R6050 R6051 R6052 R6053 R6054 R6055 R6056 R6057 R6058 R6059 R6060 R6063 R6064 R6065 R6068 R6070 R6071 R6072 R6073
2
3
4
5
6
7
8

Next Page:
SERVO (1) & POWER SUPPLY Section

3-9. SERVO (1) & POWER SUPPLY SCHEMATIC DIAGRAM


REC
50mV/50msec. div. 80mVp-p
PLAY
50mV/50µsec. div. 80mVp-p
REC/PLAY
0.5V/0.5msec. div. 0.9Vp-p
REC
1V/10msec. div. 2.6Vp-p
REC/PLAY: 4.4V DC
CUE/REV : 2.0V DC
STOP : 0.4V DC
PLAY
1V/10msec. div. 3.0Vp-p
REC
50mV/50µsec. div. 50mVp-p
PLAY
50mV/50µsec. div. 50mVp-P
REC/PLAY
2V/10msec. div. 4.0Vp-p
P202 TO MAIN
CYLINDER OFF
SO
MODE
R/S/F IN
INS/NOR/REC START
REC/PB/MEMO
S1
4.43 MHz
VSS
HEAD SW
SSS
X2001
VSX0131
OSC
IC2001
AN3615K
Q2003
2SD636
QR2002
DTC144A or UN1213
IC2002
µPC1516CA
Q2002
2SA1115
AN6914
µPC358C
IC2003
VCR0094
QR2001
DTC144A or UN1213
FG IN
PG/FG
V. REF
CYL V CTL
CAP V CTL
CURR LIM
CTL AMP OUT
REC
H.SWAY PHASE
CYL DRIVE SIGNAL
CAP DRIVE SIGNAL
P201 TO DRIVE
TRACKING
SLOW FREE RUN
CTL OUT
Q2001
2SA1115
P202 TO DRIVE
CTL IN
GND
SERVO SECTION
QR2003
DTC124A or UN1212
POWER SUPPLY SECTION
K1001
EFOA815K04G2
CR1001
D1001 MA165
IC1001
BA6149LS
OSC
QR1001
DTC124A or UN1212
D1003
MA165
D1002
MA165
IC1002
UN101
Q1001
2SD992
P203 TO SYSTEM CONTROL
12V
SYSTEM CONTROL 5V
9V OFF
P201 TO MAIN
GND
CAPSTAN FB
REG 5V
REG 9V
CYLINDER
CAPSTAN
S-REEL
T-REEL
S-REEL FB
T-REEL FB
CYLINDER FB
RO
12V OUT
P.B START
TP1003
5V/5msec. div. 5.0V DC
G
F
E
D
C
B
A
1
2
3
4
5
6
7
8
9
10

IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED BY THE SIGN ⚠ HAVE SPECIAL CHARACTERISTICS
IMPORTANT FOR SAFETY WHEN REPLACING ANY OF THESE COMPONENTS. USE ONLY
THE SPECIFIED PARTS.

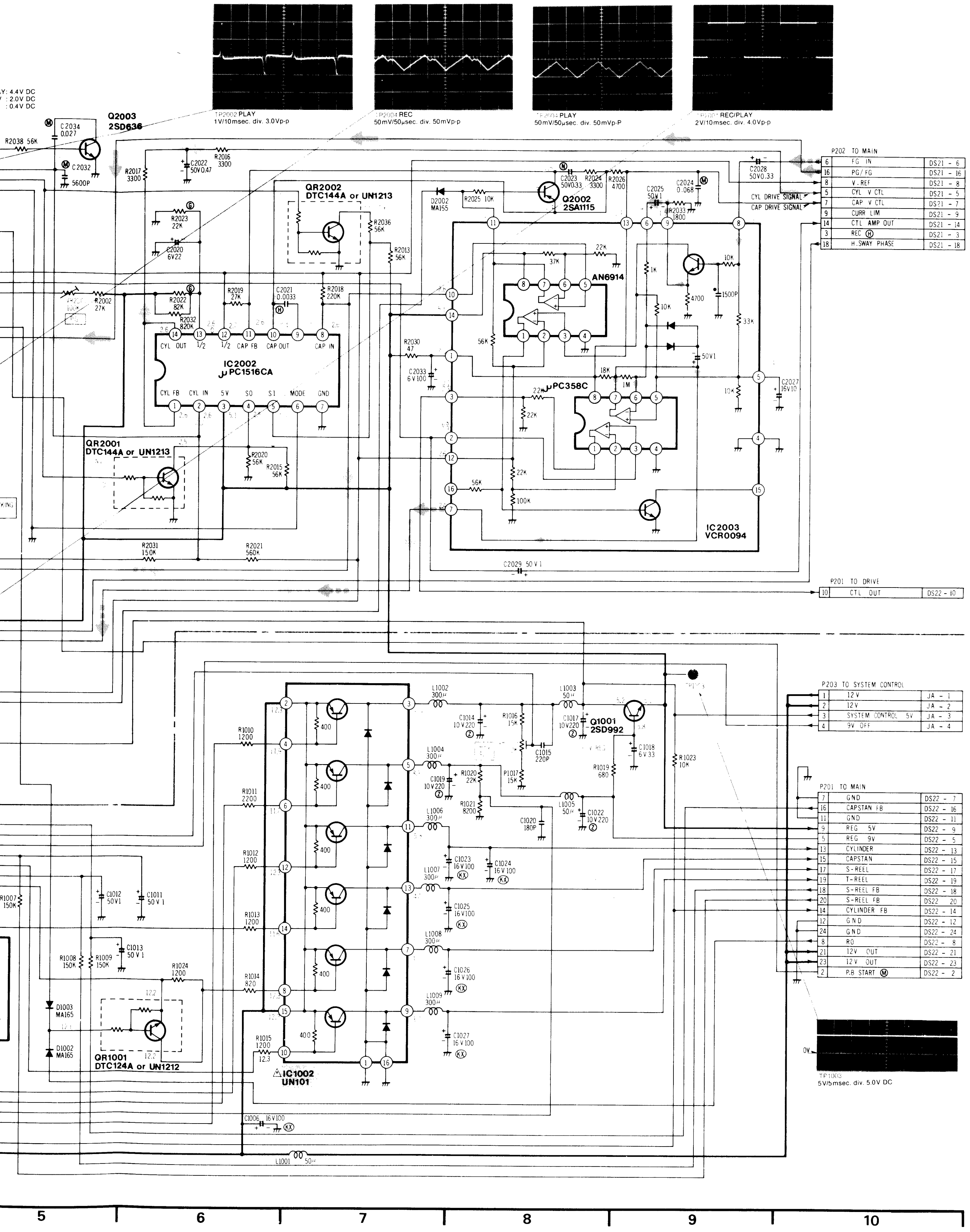
NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE IN THE BRACKETS ON THIS DIAGRAM IS RECORD MODE WITH PAL COLOUR SIGNAL.
THE MEASUREMENT MODE OF THE DC VOLTAGE OUT OF THE BRACKETS ON THIS DIAGRAM IS PLAYBACK MODE WITH PAL COLOUR SIGNAL.

SERVO (1) & POWE SUPPLY SCHEMAT	
Transistor	
Q1001	D-8
Q2001	D-3
Q2002	G-8
Q2003	G-5
Transistor & Resistor	
QR1001	A-6
QR2001	E-5
QR2002	G-7
QR2003	C-4
Integrated Circuit	
IC1001	B-3
IC1002	A-7
IC2001	E-2
IC2002	F-6
IC2003	E-9
Test Point	
TP1003	D-9
TP2001	D-4
TP2002	F-3
TP2003	D-2
TP2004	D-3
TP2015	F-3
TP2021	F-4
Adjustment	
VR1003	C-8
VR2001	F-5
VR2002	E-5
VR2013	D-1
Connector	
P201	C-10 D-1 D-10
P202	D-1 G-1 G-10
P203	D-10

ADDRESS INFORMATIO

← CYLINDER SERVO PH
← CAPSTAN SERVO PHA
← CYLINDER SERVO SP
← CAPSTAN SERVO SPE

RAM



PLAY 1V/10msec. div. 3.0Vp-p
REC 50mV/50μsec. div. 50mVp-p
PLAY 50mV/50μsec. div. 50mVp-p
REC/PLAY 2V/10msec. div. 4.0Vp-p
Q2003 2SD636
QR2002 DTC144A or UN1213
Q2002 2SA1115
AN6914
IC2002 μPC1516CA
μPC358C
IC2003 VCR0094
QR2001 DTC144A or UN1213
CYL DRIVE SIGNAL
CAP DRIVE SIGNAL
P202 TO MAIN
6 FG IN DS21 - 6
16 PG/FG DS21 - 16
8 V.REF DS21 - 8
5 CYL V CTL DS21 - 5
7 CAP V CTL DS21 - 7
9 CURR LIM DS21 - 9
14 CTL AMP OUT DS21 - 14
3 REC Ⓗ DS21 - 3
18 H.SWAY PHASE DS21 - 18
P201 TO DRIVE
10 CTL OUT DS22 - 10
P203 TO SYSTEM CONTROL
1 12V JA - 1
2 12V JA - 2
3 SYSTEM CONTROL 5V JA - 3
4 9V OFF JA - 4
P201 TO MAIN
7 GND DS22 - 7
16 CAPSTAN FB DS22 - 16
11 GND DS22 - 11
9 REG 5V DS22 - 9
5 REG 9V DS22 - 5
13 CYLINDER DS22 - 13
15 CAPSTAN DS22 - 15
17 S-REEL DS22 - 17
19 T-REEL DS22 - 19
18 S-REEL FB DS22 - 18
20 S-REEL FB DS22 20
14 CYLINDER FB DS22 - 14
12 GND DS22 - 12
24 GND DS22 - 24
8 RO DS22 - 8
21 12V OUT DS22 - 21
23 12V OUT DS22 - 23
2 P.B START Ⓜ DS22 - 2
Q1001 2SD992
IC1002 UN101
QR1001 DTC124A or UN1212
0V
5V/5msec. div. 5.0V DC
5
6
7
8
9
10

SERVO (1) & POWER SUPPLY SCHEMATIC	
Transistor	
Q1001	D-8
Q2001	D-3
Q2002	G-8
Q2003	G-5
Transistor & Resistor	
QR1001	A-6
QR2001	E-5
QR2002	G-7
QR2003	C-4
Integrated Circuit	
IC1001	B-3
IC1002	A-7
IC2001	E-2
IC2002	F-6
IC2003	E-9
Test Point	
TP1003	D-9
TP2001	D-4
TP2002	F-3
TP2003	D-2
TP2004	D-3
TP2015	F-3
TP2021	F-4
Adjustment	
VR1003	C-8
VR2001	F-5
VR2002	E-5
VR2013	D-1
Connector	
P201	C-10 D-1 D-10
P202	D-1 G-1 G-10
P203	D-10

ADDRESS INFORMATION

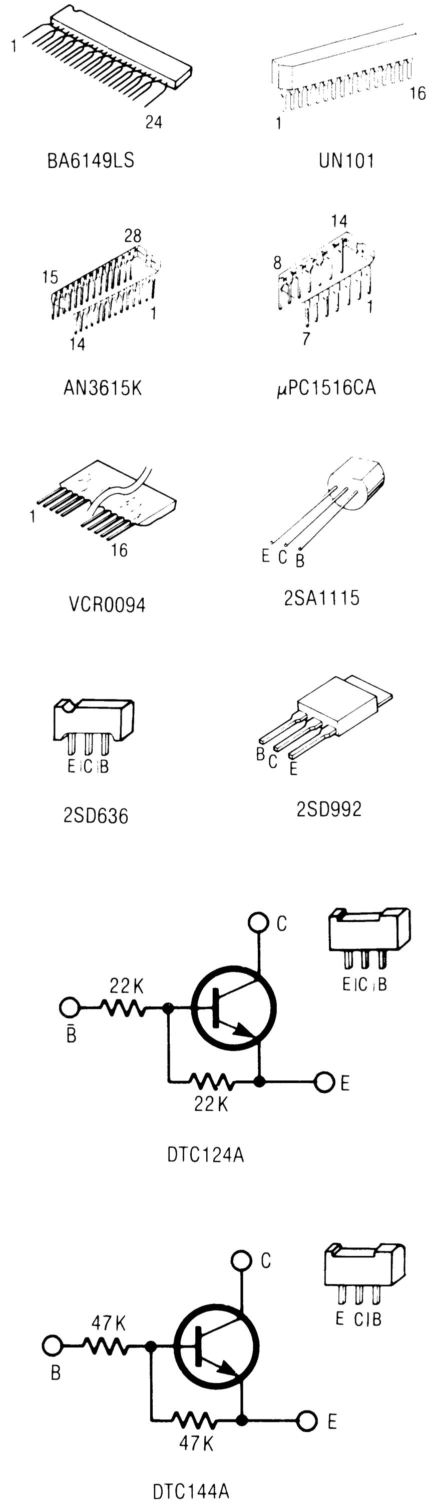
CYLINDER SERVO PHASE LOOP

CAPSTAN SERVO PHASE LOOP

CYLINDER SERVO SPEED LOOP

CAPSTAN SERVO SPEED LOOP

ICs & TRANSISTORs INFORMATION

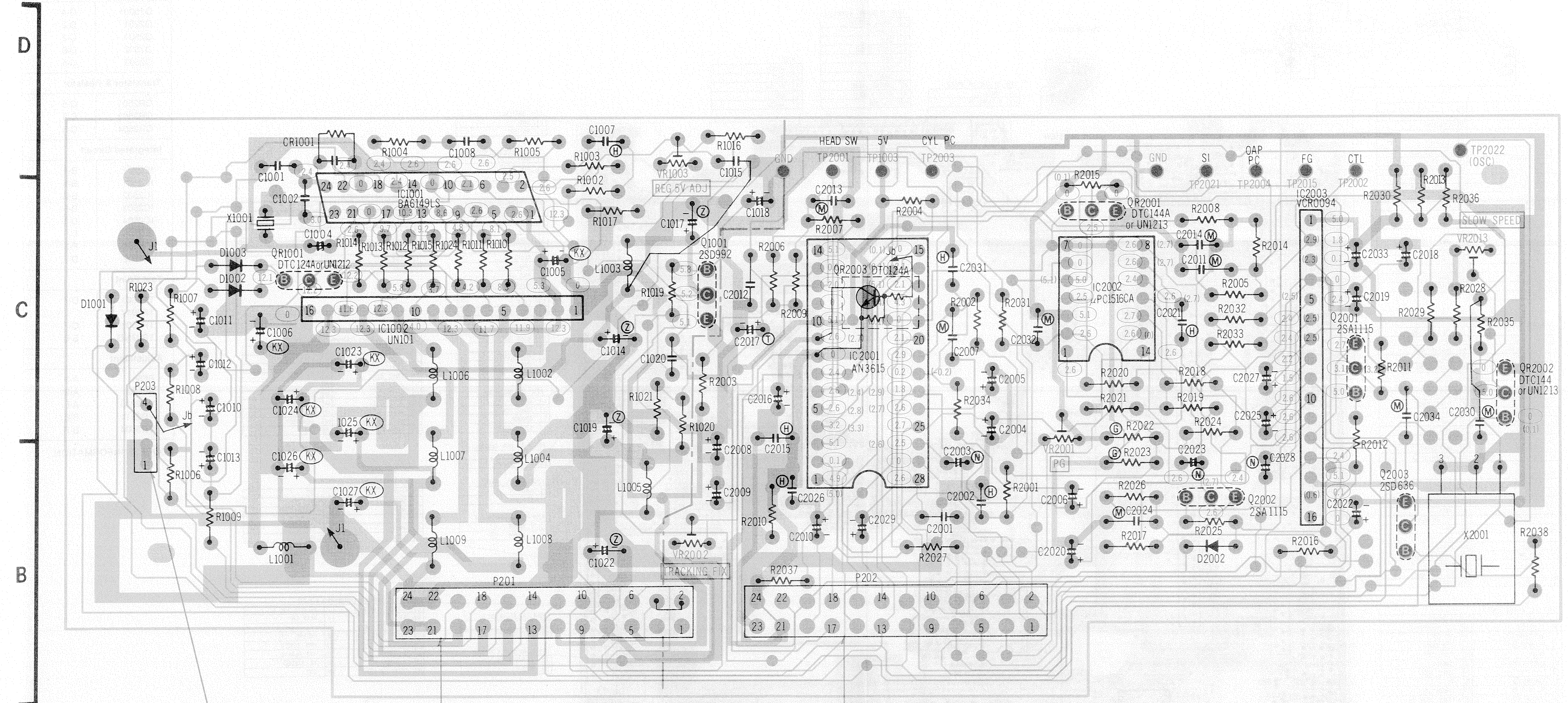


1
24
BA6149LS
1
16
UN101
28
15
1
14
AN3615K
14
8
1
7
μPC1516CA
1
16
VCR0094
E C B
2SA1115
E C B
2SD636
B C E
2SD992
C
22K
B
22K
E
E C B
DTC124A
C
47K
B
47K
E
E C B
DTC144A

SERVO (1) & POWER SUPPLY CIRCUIT BOARD	
Transistor	
Q1001	C-3
Q2001	C-5
Q2002	B-5
Q2003	B-6
Transistor & Resistor	
QR1001	C-1
QR2001	C-5
QR2002	C-6
QR2003	C-4
Integrated Circuit	
IC1001	C-2
IC1002	C-2
IC2001	C-4
IC2002	C-5
IC2003	C-5
Test Point	
TP1003	D-4
TP2001	D-4
TP2002	C-5
TP2003	D-4
TP2004	C-5
TP2015	C-5
TP2021	C-5
TP GND	D-3
TP GND	D-5
Adjustment	
VR1003	D-3
VR2001	C-4
VR2002	B-3
VR2013	C-6

ADDRESS INFORMATION

3-10. SERVO (1) & POWER SUPPLY CIRCUIT BOARD (VEP02183A)


D
C
B
A
1
2
3
4
5
6
CR1001
C1001
C1002
X1001
C1004
R1004
C1008
R1005
C1007
R1003
R1002
R1017
IC1001
BA6149LS
R1014
R1013
R1012
R1015
R1024
R1011
R1010
J1
D1003
D1002
D1001
QR1001
DTC124A or UN1212
R1023
R1007
C1011
C1005
IC1002
UN101
C1006
C1012
C1023
P203
R1008
C1010
C1024
1025
C1013
C1026
R1006
C1027
R1009
L1001
L1006
L1002
L1007
L1004
L1009
L1008
L1003
C1014
C1019
C1022
VR1003
REG 5V ADJ
R1016
C1015
C1018
C1017
Q1001
2SD992
R1019
C1020
R1021
R1020
L1005
R2003
C2012
C2017
C2016
C2008
C2015
C2009
R2010
C2026
C2010
VR2002
TRACKING FIX
P201
HEAD SW
5V
CYL PC
GND
TP2001
TP1003
TP2003
C2013
R2007
R2004
R2006
R2009
IC2001
AN3615
QR2003 DTC124A
Jb
C2031
R2002
R2031
C2032
C2007
R2034
C2005
C2004
C2003
C2002
R2001
C2029
C2001
R2027
R2037
P202
GND
SI
OAP PC
FG
CTL
TP2021
TP2004
TP2015
TP2002
TP2022 (OSC)
R2015
QR2001
DTC144A or UN1213
R2008
C2014
C2011
IC2002
µPC1516CA
C2021
R2005
R2032
R2033
R2014
R2020
R2021
R2018
R2019
C2027
VR2001
PG
R2022
R2023
R2024
C2025
C2023
C2028
R2026
C2024
C2006
R2017
C2020
R2025
D2002
Q2002
2SA1115
IC2003
VCR0094
R2016
C2022
R2030
R2013
R2036
SLOW SPEED
C2033
C2018
VR2013
C2019
R2028
R2029
R2035
Q2001
2SA1115
R2011
C2034
C2030
QR2002
DTC144 or UN1213
R2012
Q2003
2SD636
X2001
R2038

P203 (TO POWER SUPPLY)

1	12V
2	12V
3	SYSTEM CONTROL 5V
4	9V OFF

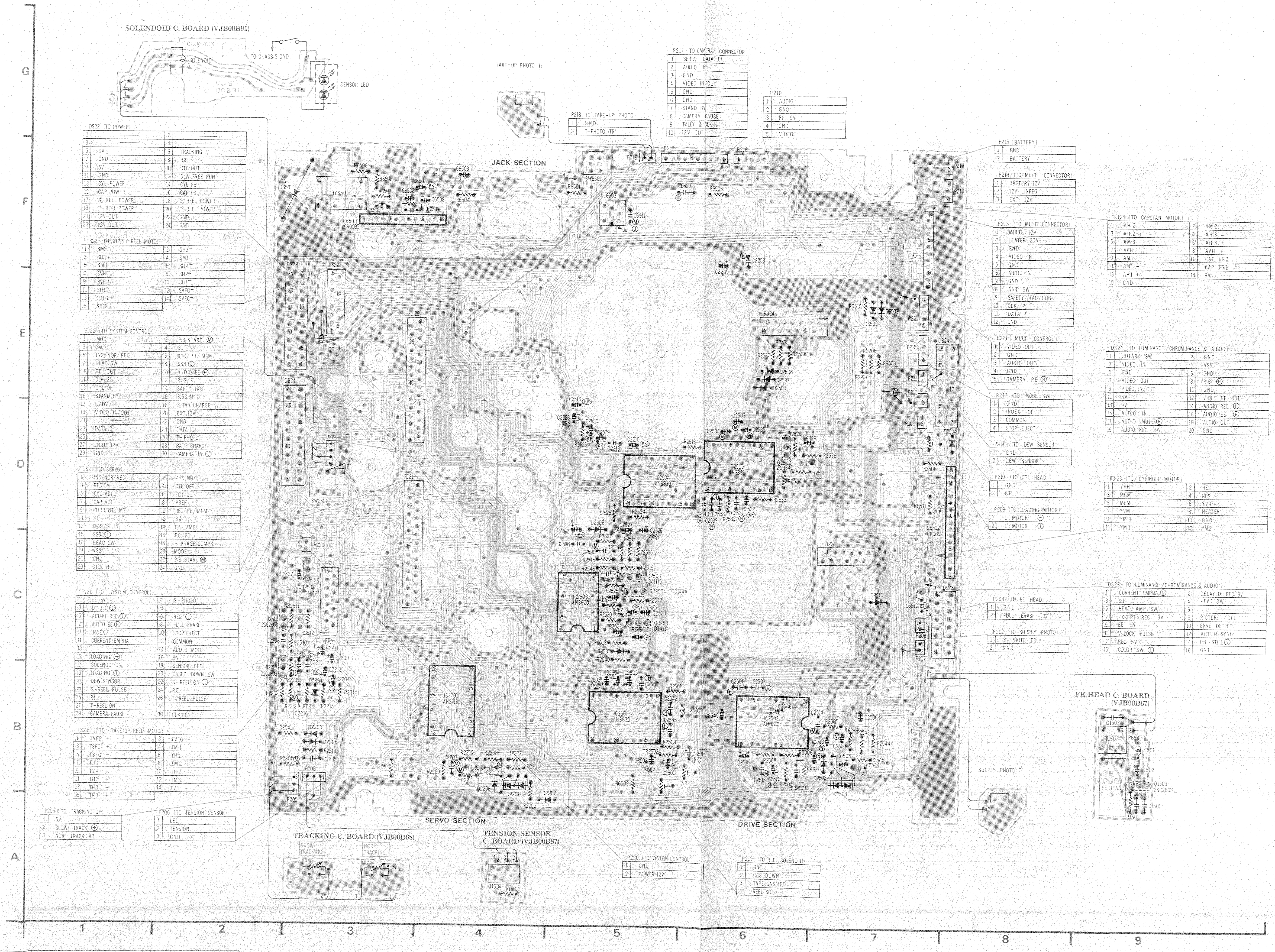
P201 (TO MAIN)

1		2	PB START Ⓜ
3		4	
5	REG 9V	6	TRACKING
7	GND	8	R Ø
9	REG 5V	10	CTL OUT
11	GND	12	SLOW FREE RUN
13	CYL POWER	14	CYL FB
15	CAP POWER	16	CAP FB
17	S-REEL POWER	18	S-REEL FB
19	T-REEL POWER	20	T-REEL FB
21	12V OUT	22	GND
23	12V OUT	24	GND

P202 (TO MAIN)

1	Ins/Nor/Rec	2	4.43MHz
3	REC Ⓗ 5V	4	CYL OFF Ⓗ
5	CYL VCTL	6	FG IN
7	CAP VCTL	8	V REF
9	CURRENT LIMIT	10	REC/PB/MEM
11	S1	12	S Ø
13	R/S/F IN	14	CTL AMP OUT
15	SSS Ⓛ	16	PG/FG
17	HEAD SW	18	H SWAY PHASE
19	Vss	20	MODE
21	GND	22	PB START Ⓜ
23	CTL IN	24	GND

3-11. MAIN [Servo (2), Drive, Jack, Picture VR] CIRCUIT BOARD (VEP02184A)


SOLENDOID C. BOARD (VJB00B91)
SOLENOID
TO CHASSIS GND
SENSOR LED
TAKE-UP PHOTO Tr
JACK SECTION
P217 TO CAMERA CONNECTOR
P216
P218 TO TAKE-UP PHOTO
P215 (BATTERY)
P214 (TO MULTI CONNECTOR)
P213 (TO MULTI CONNECTOR)
FJ24 (TO CAPSTAN MOTOR)
P221 (MULTI CONTROL)
P212 (TO MODE SW)
DS24 (TO LUMINANCE/CHROMINANCE & AUDIO)
P211 (TO DEW SENSOR)
P210 (TO CTL HEAD)
FJ23 (TO CYLINDER MOTOR)
P209 (TO LOADING MOTOR)
DS23 (TO LUMINANCE/CHROMINANCE & AUDIO)
P208 (TO FE HEAD)
P207 (TO SUPPLY PHOTO)
DS22 (TO POWER)
FS22 (TO SUPPLY REEL MOTOR)
FJ22 (TO SYSTEM CONTROL)
DS21 (TO SERVO)
FJ21 (TO SYSTEM CONTROL)
FS21 (TO TAKE UP REEL MOTOR)
P205 (TO TRACKING UP)
P206 (TO TENSION SENSOR)
TRACKING C. BOARD (VJB00B68)
TENSION SENSOR C. BOARD (VJB00B87)
SERVO SECTION
DRIVE SECTION
P220 (TO SYSTEM CONTROL)
P219 (TO REEL SOLENOID)
FE HEAD C. BOARD (VJB00B67)
SUPPLY PHOTO Tr
IC2201 AN3715S
IC2501 AN3830
IC2502 AN3810
IC2503 AN3829
IC2504 AN3820
IC2505 AN3821
G
F
E
D
C
B
A
1
2
3
4
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9

MAIN [SERVO (2), DRIVE JACK & PICTURE VR] CIRCUIT BOARD	
Transistor	
Q1503	G-4
Q2201	B-2
Q2501	C-2
Q2502	D-6
Q2503	C-5
Transistor & Resistor	
QR2501	C-5
QR2503	C-3
QR2504	C-5
Integrated Circuit	
IC2201	B-4
IC2501	B-5
IC2502	B-6
IC2503	B-5
IC2504	D-5
IC2505	D-6
IC6501	F-3
IC6502	D-7
Test Point	
TP2501	D-7
TP3017	
TP3501	C-7
TP GND	B-6
Adjustment	
R6561	A-3
R6562	A-3
VR2210	A-5
VR2211	B-6
VR3504	B-7

ADDRESS INFORMATION

Back Page:
SERVO(1) & POWER SUPPLY Section

MAIN ICs DC VOLTAGE CHART

REF. NO.	IC2201																							
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
STOP	0	5.0	4.9	0	2.1	2.1	4.4	0.1	2.5	0.7	2.1	0.7	0	0	2.5	0	2.7	0.1	0.6	5.0	4.3	4.1	4.8	0.7
PLAY	4.5	2.1	0.1	5.0	0	0	0.1	2.6	2.5	1.1	2.2	1.1	0	0	2.5	0	2.7	0.1	1.1	5.0	2.5	4.8	4.8	0
REC	0.1	5.1	0.1	5.0	0.1	0	0.1	2.6	2.5	0.7	2.1	0.6	0	0	2.5	0	2.7	0.1	0.6	5.1	2.0	4.8	4.9	2.4
F.F	0	5.0	4.9	0	2.1	2.1	4.4	0.1	2.5	0.6	2.0	0.6	0	0	2.5	0	2.7	0.1	0.5	5.0	4.3	4.1	4.8	0.6
REW	0	5.0	4.9	0	2.1	2.1	4.4	0.1	2.5	0.8	2.2	0.8	0	0	2.5	0	2.7	0.1	0.8	5.0	4.3	4.1	4.8	0.6

REF. NO.	IC2201																							
MODE	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42						
STOP	1.6	1.6	0	2.9	2.3	3.1	2.7	2.3	5.1	2.5	1.7	0	2.1	0	0	0	5.1	0						
PLAY	1.6	1.6	0	2.9	2.3	3.1	2.7	2.3	0	2.5	1.7	0	2.1	0	0	2.0	5.1	0						
REC	1.6	1.6	0	2.9	2.4	3.1	2.7	2.4	5.1	2.5	1.8	0	2.0	0	0	2.0	5.1	0						
F.F	1.6	1.6	0	2.9	2.3	3.1	2.7	2.3	5.1	2.5	1.7	0	2.1	0	0	0	5.1	0						
REW	1.6	1.6	0	2.9	2.3	3.1	2.7	2.3	5.1	2.5	1.7	0	5.1	3.1	5.0	0	5.1	0						

REF. NO.	IC2501																							
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
STOP	1.5	0	1.5	2.4	1.9	1.8	1.8	1.9	1.9	1.9	0.1	5.1	5.1	3.1	5.0	0.2	4.9	0	5.0	0	0	0	1.5	3.6
PLAY	0.8	0	0.8	2.4	1.9	1.9	1.9	1.9	1.9	1.9	2.5	2.5	5.1	3.1	0.1	0	0.1	0.5	0	0	0.6	0.1	0.8	3.3
REC	0.8	0.1	0.8	2.4	1.9	1.9	1.9	1.9	1.9	1.9	2.5	2.5	5.1	3.1	0.1	0	0.1	0.5	0	0	0.6	0	0.8	3.3
F.F	1.9	0	1.9	2.4	1.9	1.9	1.9	1.9	1.9	1.9	2.6	2.5	5.1	3.1	0.1	0	4.9	0.5	0	0	0.6	0	1.9	4.2
REW	2.6	0.1	2.6	2.5	1.9	1.9	1.9	1.9	1.9	1.9	2.6	2.5	5.1	3.1	0.1	0.1	4.9	0.6	0	0	0.6	0.1	2.5	5.4

REF. NO.	IC2502																							
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
STOP	5.0	5.0	3.5	3.3	0.1	0	9.5	5.4	9.2	0.7	2.6	0	4.5	1.7	1.2	2.8	2.8	0	2.4	5.0	0	0	5.0	0
PLAY	5.3	5.3	3.5	3.3	0.1	0.1	9.5	2.4	8.3	0.9	2.7	0	2.6	1.4	1.3	2.7	2.7	0	2.1	5.6	0.1	0	5.3	0.1
REC	5.3	5.3	3.5	3.3	0.1	0.1	9.5	2.4	8.3	0.9	2.7	0	2.6	1.4	1.3	2.7	2.7	0	2.1	5.5	0.1	0	5.3	0.1
F.F	4.8	4.8	3.5	3.3	0	0	9.5	5.4	9.2	0.7	2.7	0	4.5	1.7	1.2	2.8	2.8	0	2.4	4.1	0	0	4.1	0
REW	4.8	4.8	3.5	3.3	0	0	9.5	5.4	9.2	0.7	2.6	0	4.5	1.7	1.2	2.8	2.7	0	2.4	5.7	0	0	5.6	0

REF. NO.	IC2503																							
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
STOP	1.2	1.3	0	0.3	0.3	0.3	0.3	0	2.1	5.0	2.2	2.9	5.1	0	0.3	0.1	0.1	5.0	0	2.6	0.2	0	2.6	3.2
PLAY	1.3	0	0	2.8	2.8	3.0	3.0	0	0	0	2.2	2.9	5.1	0.1	0	0.1	0.1	0.1	0.1	2.6	2.8	2.8	2.6	2.6
REC	1.3	1.3	0	2.9	2.8	3.1	3.0	0	0.1	0.1	2.2	2.9	5.1	0.1	0	0.1	0.1	0.1	0.1	2.6	2.8	2.8	2.7	2.6
F.F	1.3	1.3	0	2.3	2.2	0.3	0.4	0	0	5.0	2.2	2.9	5.1	0	0	0.1	0.1	0.1	0.1	2.6	0.2	0	2.6	3.2
REW	1.3	1.3	0	2.4	2.3	0.3	0.3	0	5.0	5.0	2.2	2.9	5.1	0.1	0.1	0.1	0	0.1	0	2.6	0.2	0	2.6	3.2

REF. NO.	IC2503																							
MODE	25	26	27	28																				
STOP	2.6	2.6	1.2	1.3																				
PLAY	2.6	2.6	1.3	1.3																				
REC	2.6	2.6	1.3	1.3																				
F.F	2.6	2.6	1.3	1.3																				
REW	2.6	2.6	1.3	1.3																				

REF. NO.	IC2504																							
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
STOP	1.6	0	1.6	2.4	1.9	2.0	2.0	1.9	1.9	1.9	0.1	0.1	5.1	3.1	5.0	0.1	4.9	0	5.0	0	0.1	0	1.6	3.5
PLAY	1.8	0.1	1.8	1.8	2.0	2.0	2.0	2.0	2.0	2.0	2.5	2.5	5.1	3.1	0.1	0.1	0.1	0.5	0	0	0.6	0.	1.8	3.9
REC	1.8	0.1	1.8	2.5	2.0	2.0	2.0	2.0	2.0	2.0	2.5	2.5	5.1	3.2	0.1	0.1	0.1	0.5	0	0	0.6	0.	1.8	3.9
F.F	3.3	0.1	3.3	2.5	1.9	1.9	1.9	1.9	2.0	2.0	2.5	2.5	5.1	3.1	0.1	0.1	4.9	0.6	0	0	0.6	0.	3.3	6.9
REW	2.3	0	2.3	2.4	1.9	1.9	1.9	1.9	2.0	2.0	2.6	2.5	5.1	3.1	0.1	0	4.9	0.4	0	0	0.5	0	2.7	5.9

REF. NO.	IC2505																							
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
STOP	2.6	0	2.6	0	1.6	1.5	1.4	1.6	1.5	1.5	2.1	0.1	5.1	3.1	2.5	0.7	4.9	0.5	0.4	0	0	0.	2.6	12.3
PLAY	2.2	0.1	2.2	0	1.5	1.5	1.5	1.5	1.5	1.5	0	0	5.1	3.1	2.5	2.4	0.1	0.5	0.4	0.1	0	0.5	2.2	4.1
REC	2.2	0	2.2	0	1.5	1.5	1.5	1.5	1.5	1.5	0	0	5.1	3.1	2.5	2.4	0.1	0.5	0.4	0	0	0.5	2.2	4.1
F.F	2.6	0	2.6	0	1.6	1.5	1.4	1.6	1.5	1.5	2.1	0.3	5.1	3.1	2.5	0.6	4.9	0.5	0.4	0	0	0.	0	12.2
REW	2.6	0	2.6	0	1.6	1.5	1.4	1.6	1.5	1.5	2.1	0.3	5.1	3.1	2.5	0.7	4.9	0.5	0.4	0	0	0.	2.6	12.1

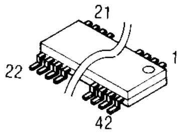
REF. NO.	IC6501																							
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13											
STOP	9.6	12.4	4.6	4.2	0.2	9.6	0	9.6	3.3	0.5	1.0	6.6	0											
PLAY	9.6	12.4	0	4.2	0.2	9.6	0	9.6	3.2	0.5	1.0	6.6	0											
REC	9.6	12.4	0.1	4.2	0.2	9.6	0	9.6	3.3	0.5	1.0	6.6	0											
F.F	9.6	12.4	4.6	4.2	0.2	9.6	0	9.6	3.3	0.5	1.0	6.6	0											
REW	9.6	12.4	4.6	4.2	0.2	9.6	0	9.6	3.3	0.5	1.0	6.6	0											

REF. NO.	IC6502																							
MODE	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17							
STOP	0	−0.1	0	5.1	5.1	4.6	4.9	5.0	5.0	9.6	0	9.3	0.2	9.6	0	9.6	0.7							
PLAY	0	−0.1	0	5.1	0.3	4.6	4.9	0	0	9.6	0	9.4	0.3	9.6	0.3	9.6	0.7							
REC	0	5.1	0	5.1	2.5	0.1	0.1	5.0	5.1	0.1	9.5	0.2	9.5	3.3	9.6	9.6	0.7							
F.F	0	−0.1	0	5.1	5.1	4.6	4.9	5.0	5.0	9.6	0	9.3	0.1	9.6	0.1	9.6	0.7							
REW	0	−0.1	0	5.0	5.1	4.6	4.9	5.0	5.0	9.6	0	9.3	0	9.6	0.1	9.6	0							

MAIN TRANSISTORs DC VOLTAGE CHART

REF. NO.	Q2201								
MODE	E	C	B						
STOP	0	4.4	0						
PLAY	0	2.6	0						
REC	0	2.6	0						
F.F	0	4.4	0						
REW	0	4.4	0						
REF. NO.	Q2501			Q2502			Q2503		
MODE	E	C	B	E	C	B	E	C	B
STOP	0	4.3	0	7.7	7.6	7.0	5.1	4.6	5.0
PLAY	1.8	4.3	2.5	2.8	2.6	2.2	5.1	5.1	4.5
REC	1.8	4.3	2.5	2.8	2.6	2.3	5.1	5.1	4.5
F.F	1.8	4.3	2.5	7.6	7.6	7.0	5.1	5.2	4.9
REW	1.8	4.3	2.5	7.6	7.6	7.0	5.1	3.7	4.9
REF. NO.	QR2501			QR2503			QR2504		
MODE	E	C	B	E	C	B	E	C	B
STOP	5.1	2.4	5.0	0	5.1	0	0	0	5.0
PLAY	5.1	5.1	3.9	0	0	5.0	0	2.8	0
REC	5.1	5.1	4.0	0	0	5.0	0	2.7	0
F.F	5.1	2.9	5.0	0	5.1	0	0	0	5.0
REW	5.1	2.9	5.0	0	5.1	0	0	0	5.0

ICs & TRANSISTORs INFORMATION



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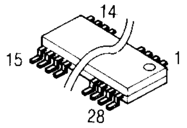

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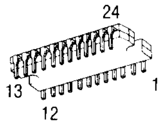
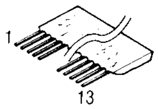
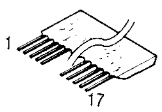


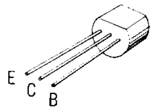
AN3810K
AN3821K
AN3830K



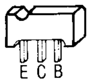
VCR0095



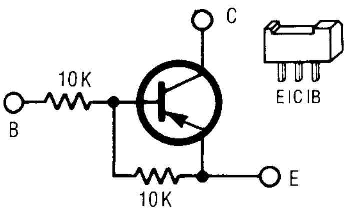
VCR0092



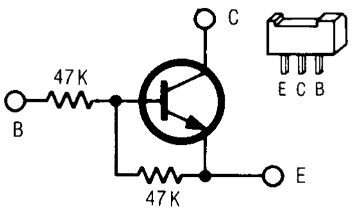
2SC2603
2SA1115
2SD2603A



2SB641



DTA114A

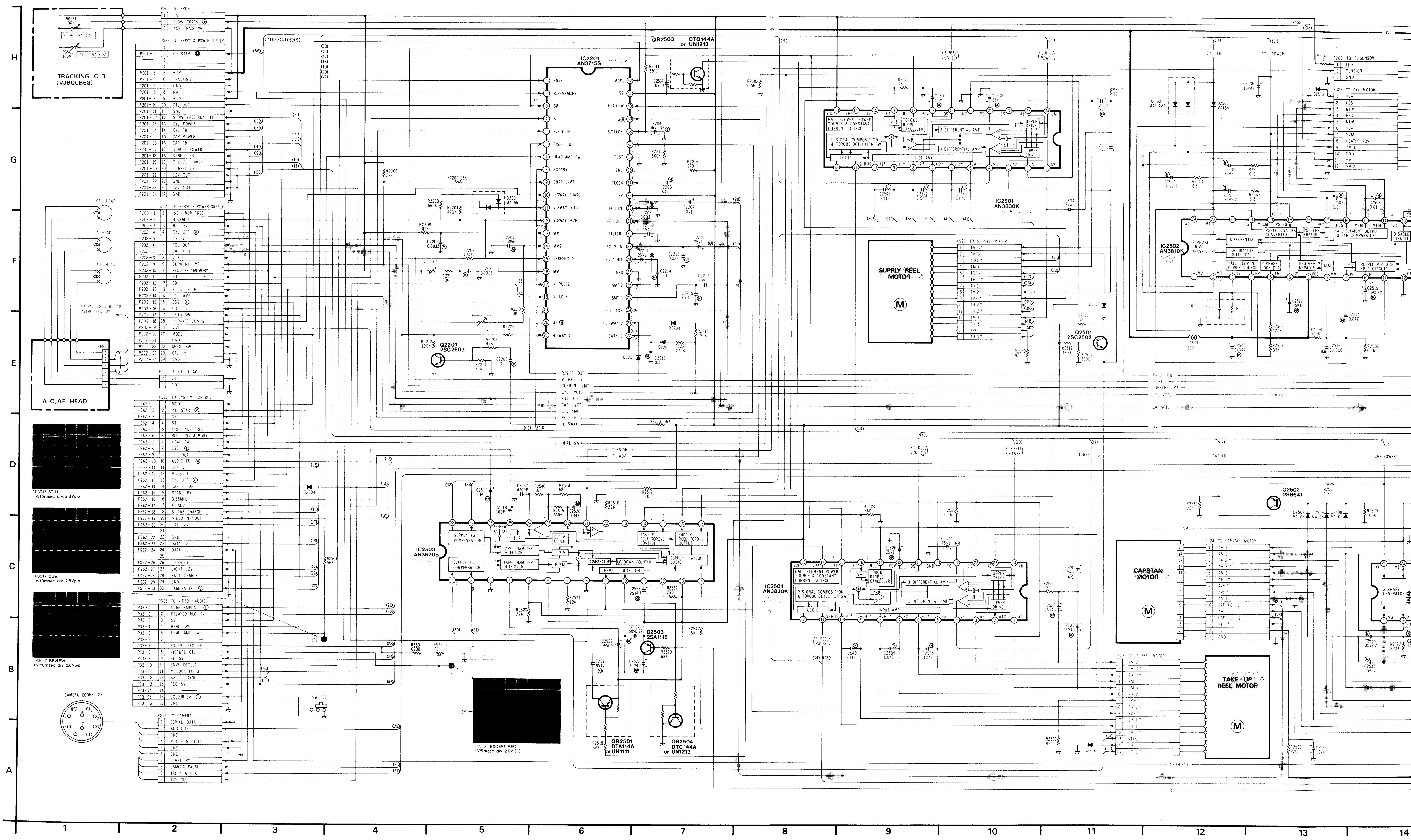


DTC144A

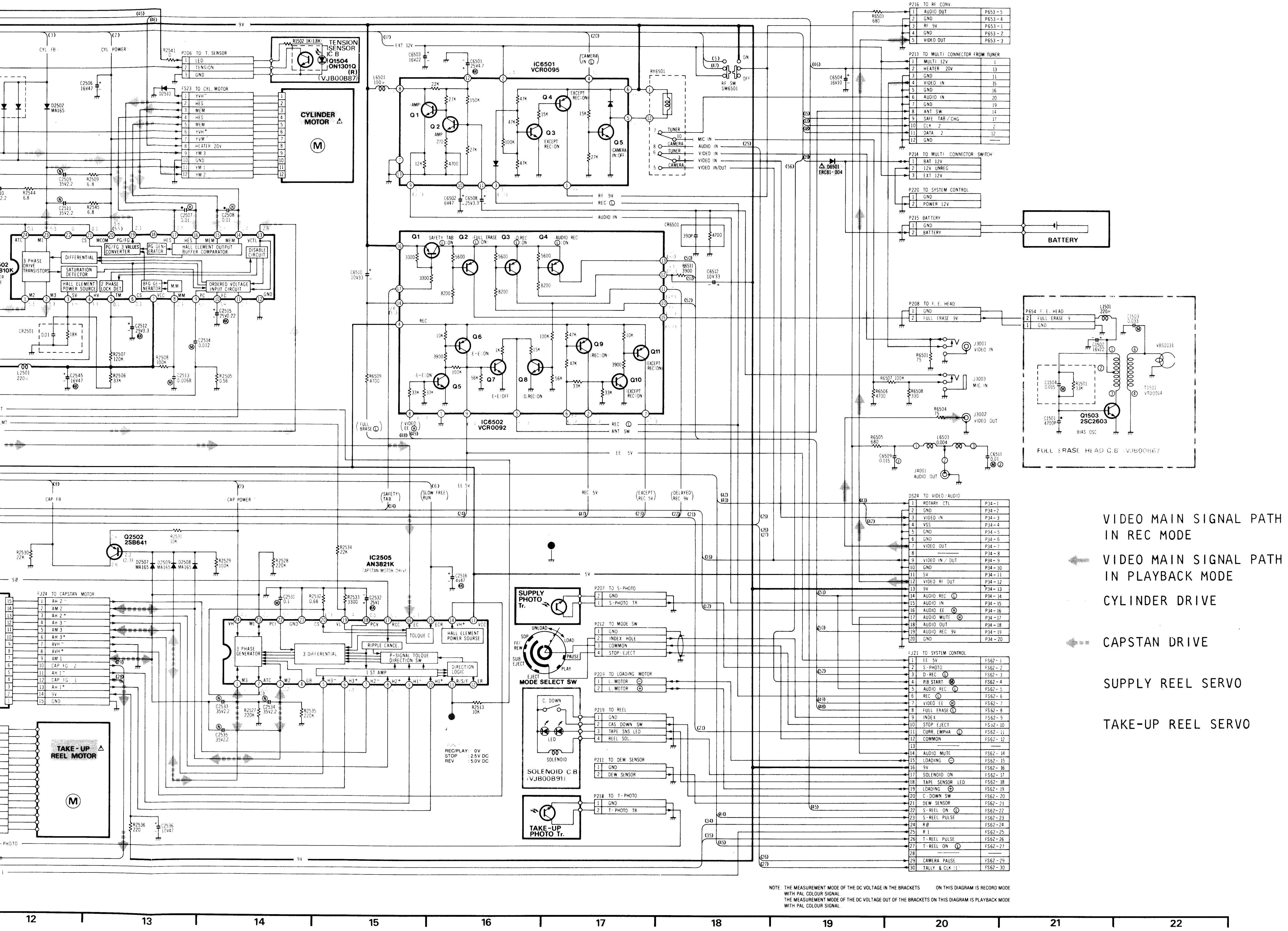
MAIN [SERVO (2), DRIVE, JACK & PICTURE VR] SCHEMATIC	
Transistor	
Q1503	E-21
Q2201	E-5
Q2501	E-11
Q2502	C-13
Q2503	B-7
Transistor & Resistor	
QR2501	A-6
QR2503	H-7
QR2504	A-7
Integrated Circuit	
IC2201	H-6
IC2501	G-10
IC2502	F-12
IC2503	C-5
IC2504	C-8
IC2505	C-14
IC6501	H-17
IC6502	E-16
Test Point	
TP2501	B-16
TP3017	B-7
TP3501	B-5
TP GND	D-17
Adjustment	
R6561	H-1
R6562	H-1
VR2210	E-5
VR2211	F-5
VR3504	B-5
Connector	
DS21	F-2
DS22	H-2
DS23	C-2
DS24	D-20
FJ21	C-20
FJ22	E-2
FJ24	C-12
FS21	F-10
FS22	B-11
FS23	H-23
P205	H-2
P206	H-13
P207	C-17
P208	F-20
P209	C-17
P210	E-2
P211	B-17
P212	C-17
P213	H-20
P214	G-20
P215	G-20
P216	H-20
P217	A-2
P218	A-17
P219	B-17
P220	G-20
P221	F-20
P654	F-21

ADDRESS INFORMATION

3-12. MAIN [Servo (2), Drive, Jack, Picture VR] SCHEMATIC DIAGRAM

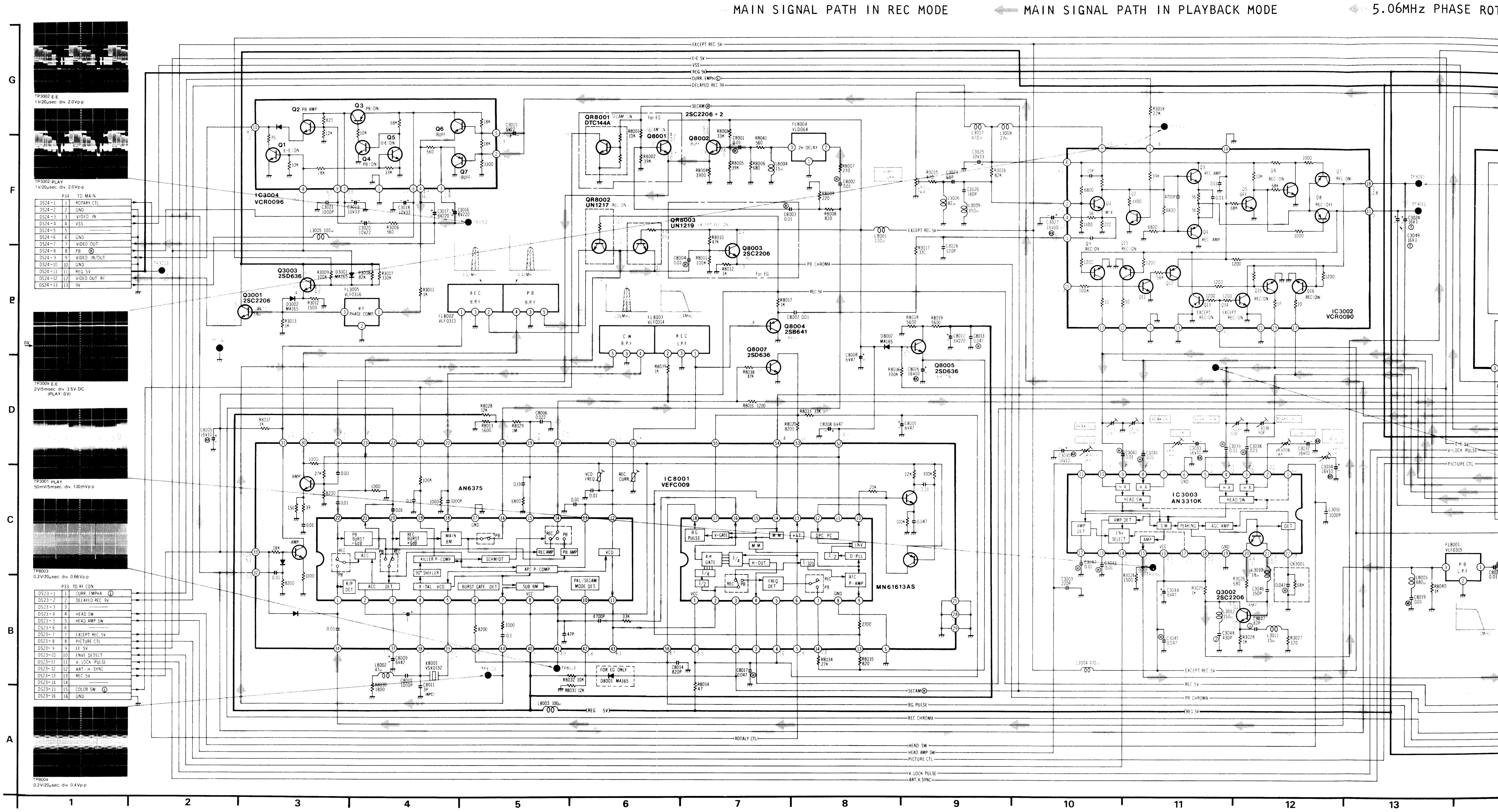


TRACKING C.B (VJB00B68)
P205 TO FRONT
DS22 TO SERVO & POWER SUPPLY
DS21 TO SERVO & POWER SUPPLY
CTL HEAD
A. HEAD
A.E. HEAD
A/C.AE HEAD
P210 TO CTL HEAD
FJ22 TO SYSTEM CONTROL
DS23 TO VIDEO / AUDIO
P217 TO CAMERA
CAMERA CONNECTOR
SW2501
TP3017 STILL
1V/10msec. div. 2.8Vp-p
TP3017 CUE
1V/10msec. div. 2.8Vp-p
TP3017 REVIEW
1V/10msec. div. 2.8Vp-p
TP3501 EXCEPT REC
1V/5msec. div. 2.0V DC
IC2201 AN3715S
Q2201 2SC2603
QR2503 DTC144A or UN1213
IC2501 AN3830K
SUPPLY REEL MOTOR
Q2501 2SC2603
IC2502 AN3810K
P206 TO T. SENSOR
FS23 TO CYL MOTOR
FS21 TO S. REEL MOTOR
IC2503 AN3620S
Q2503 2SA1115
QR2501 DTA114A or UN1111
QR2504 DTC144A or UN1213
IC2504 AN3830K
Q2502 2SB641
CAPSTAN MOTOR
TAKE-UP REEL MOTOR
FJ24 TO CAPSTAN MOTOR
FS22 TO T. REEL MOTOR
H
G
F
E
D
C
B
A
1
2
3
4
5
6
7
8
9
10
11
12
13
14

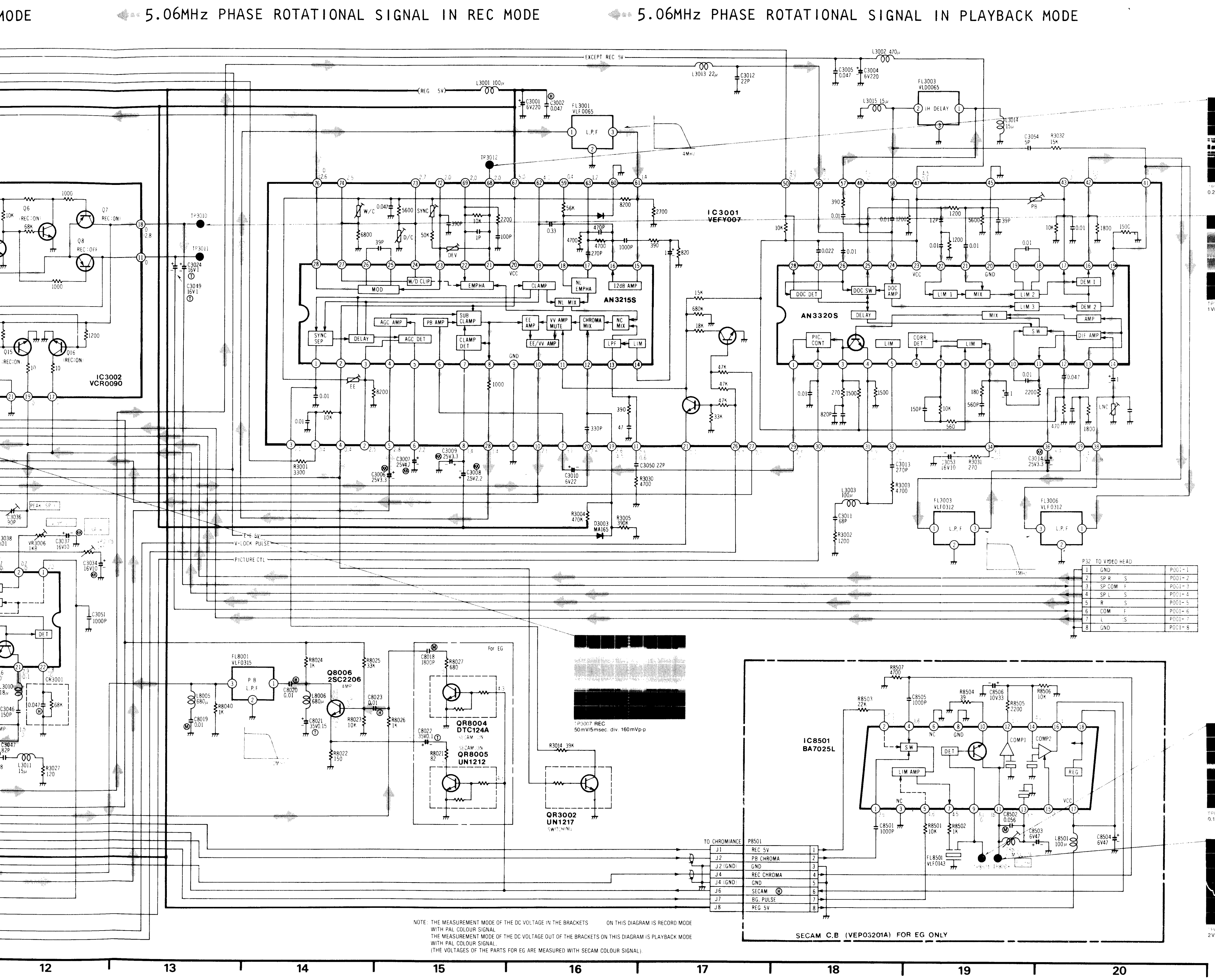

TENSION SENSOR IC B
Q1504 ON1301Q (R)
(VJB00B87)
R1502 1K/1.8K
P206 TO T. SENSOR
LED
TENSION
GND
FS23 TO CYL. MOTOR
CYLINDER MOTOR △
CYL FB
CYL POWER
IC6501 VCR0095
Q1 AMP
Q2 AMP
Q3 EXCEPT REC ON
Q4 EXCEPT REC ON
Q5 CAMERA IN/OFF
RY6501
RF SW SW6501
ON
OFF
TUNER
CAMERA
MIC IN
AUDIO IN
VIDEO IN
VIDEO IN/OUT
EXT 12V
RF 9V
REC Ⓗ
AUDIO IN
D6501 ERC81-004
IC6502 VCR0092
Q1 SAFETY TAB Ⓗ ON
Q2 FULL ERASE Ⓗ ON
Q3 D.REC Ⓗ ON
Q4 AUDIO REC Ⓗ ON
Q5 E-E ON
Q6 E-E ON
Q7 E-E OFF
Q8 D.REC ON
Q9 REC ON
Q10 EXCEPT REC ON
Q11 EXCEPT REC ON
CR6501
REC Ⓗ
ANT SW
EE 5V
REC 5V
(FULL) ERASE Ⓛ
(VIDEO EE Ⓗ)
(SAFETY) TAB
(SLOW FREE) RUN
(EXCEPT) REC 5V
(DELAYED) REC 9V
3 PHASE DRIVE TRANSISTORS
DIFFERENTIAL
SATURATION DETECTOR
HALL ELEMENT POWER SOURCE
2 PHASE LOCK DET.
PG/FG 3 VALUES CONVERTER
PG GENERATOR
BFG GENERATOR
MM
HALL ELEMENT OUTPUT BUFFER COMPARATOR
ORDERED VOLTAGE INPUT CIRCUIT
DISABLE CIRCUIT
Q2502 2SB641
IC2505 AN3821K
CAPSTAN MOTOR DRIVE
3 PHASE GENERATOR
3 DIFFERENTIAL
RIPPLE CANCEL
TOLQUE C
P-SIGNAL TOLQUE DIRECTION SW
1 ST AMP
HALL ELEMENT POWER SOURSE
DIRECTION LOGIC
FJ24 TO CAPSTAN MOTOR
CAP FB
CAP POWER
TAKE-UP REEL MOTOR △
REC/PLAY 0V
STOP 2.5V DC
REV 5.0V DC
SUPPLY PHOTO Tr.
P207 TO S-PHOTO
GND
S-PHOTO TR
MODE SELECT SW
UNLOAD
LOAD
PAUSE
PLAY
EJECT
SUB EJECT
FF/REW
SDP
P212 TO MODE SW
GND
INDEX HOLE
COMMON
STOP EJECT
P209 TO LOADING MOTOR
L. MOTOR ⊖
L. MOTOR ⊕
SOLENOID C.B (VJB00B91)
C. DOWN
LED
SOLENOID
P219 TO REEL
GND
CAS DOWN SW
TAPE SNS LED
REEL SOL
P211 TO DEW SENSOR
GND
DEW SENSOR
TAKE-UP PHOTO Tr.
P218 TO T-PHOTO
GND
T-PHOTO TR
P216 TO RF CONV.
1 AUDIO OUT P653-5
2 GND P653-4
3 RF 9V P653-1
4 GND P653-2
5 VIDEO OUT P653-3
P213 TO MULTI CONNECTOR FROM TUNER
1 MULTI 12V 1
2 HEATER 20V 13
3 GND 11
4 VIDEO IN 15
5 GND 16
6 AUDIO IN 20
7 GND 19
8 ANT SW 14
9 SAFE TAB/CHG 17
10 CLK 2 2
11 DATA 2 12
12 GND
P214 TO MULTI CONNECTOR SWITCH
1 BAT 12V
2 12V UNREG
3 EXT 12V
P220 TO SYSTEM CONTROL
1 GND
2 POWER 12V
P215 BATTERY
1 GND
2 BATTERY
BATTERY
P208 TO F. E. HEAD
1 GND
2 FULL ERASE 9V
J3001 VIDEO IN
J3003 MIC IN
J3002 VIDEO OUT
J4001 AUDIO OUT
P654 F. E. HEAD
2 FULL ERASE 9
1 GND
L1501 220μ
T1501 VT0001A
Q1503 2SC2603
BIAS OSC
VBS0031
FULL ERASE HEAD C.B (VJB00B67)
DS24 TO VIDEO/AUDIO
1 ROTARY CTL P34-1
2 GND P34-2
3 VIDEO IN P34-3
4 VSS P34-4
5 GND P34-5
6 GND P34-6
7 VIDEO OUT P34-7
8 P34-8
9 VIDEO IN/OUT P34-9
10 GND P34-10
11 5V P34-11
12 VIDEO RF OUT P34-12
13 9V P34-13
14 AUDIO REC Ⓛ P34-14
15 AUDIO IN P34-15
16 AUDIO EE Ⓗ P34-16
17 AUDIO MUTE Ⓗ P34-17
18 AUDIO OUT P34-18
19 AUDIO REC 9V P34-19
20 GND P34-20
FJ21 TO SYSTEM CONTROL
1 EE 5V FS62-1
2 S-PHOTO FS62-2
3 D·REC Ⓛ FS62-3
4 P.B START Ⓜ FS62-4
5 AUDIO REC Ⓛ FS62-5
6 REC Ⓛ FS62-6
7 VIDEO EE Ⓗ FS62-7
8 FULL ERASE Ⓛ FS62-8
9 INDEX FS62-9
10 STOP EJECT FS62-10
11 CURR. EMPHA Ⓛ FS62-11
12 COMMON FS62-12
13
14 AUDIO MUTE FS62-14
15 LOADING ⊖ FS62-15
16 9V FS62-16
17 SOLENOID ON FS62-17
18 TAPE SENSOR LED FS62-18
19 LOADING ⊕ FS62-19
20 C·DOWN SW FS62-20
21 DEW SENSOR FS62-21
22 S-REEL ON Ⓛ FS62-22
23 S-REEL PULSE FS62-23
24 RØ FS62-24
25 R 1 FS62-25
26 T-REEL PULSE FS62-26
27 T-REEL ON Ⓛ FS62-27
28
29 CAMERA PAUSE FS62-29
30 TALLY & CLK (1) FS62-30
VIDEO MAIN SIGNAL PATH IN REC MODE
VIDEO MAIN SIGNAL PATH IN PLAYBACK MODE
CYLINDER DRIVE
CAPSTAN DRIVE
SUPPLY REEL SERVO
TAKE-UP REEL SERVO
12
13
14
15
16
17
18
19
20
21
22

NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE IN THE BRACKETS ON THIS DIAGRAM IS RECORD MODE WITH PAL COLOUR SIGNAL.
THE MEASUREMENT MODE OF THE DC VOLTAGE OUT OF THE BRACKETS ON THIS DIAGRAM IS PLAYBACK MODE WITH PAL COLOUR SIGNAL.

3-13. LUMINANCE & CHROMINANCE SCHEMATIC DIAGRAM


MAIN SIGNAL PATH IN REC MODE
MAIN SIGNAL PATH IN PLAYBACK MODE
5.06MHz PHASE ROT
TP3002 E-E
1V/20μsec. div. 2.0Vp-p
TP3002 PLAY
1V/20μsec. div. 2.0Vp-p
P34 TO MAIN
DS24-1 1 ROTARY CTL
DS24-2 2 GND
DS24-3 3 VIDEO IN
DS24-4 4 VSS
DS24-5 5
DS24-6 6 GND
DS24-7 7 VIDEO OUT
DS24-8 8 PB Ⓗ
DS24-9 9 VIDEO IN/OUT
DS24-10 10 GND
DS24-11 11 REG 5V
DS24-12 12 VIDEO OUT RF
DS24-13 13 9V
0V
TP3004 E-E
2V/5msec. div. 3.5V DC
(PLAY: 0V)
TP3001 PLAY
50mV/5msec. div. 130mVp-p
TP8003
0.2V/20μsec. div. 0.66Vp-p
P33 TO RF CON
DS23-1 1 CURR. EMPHA Ⓛ
DS23-2 2 DELAYED REC 9V
DS23-3 3
DS23-4 4 HEAD SW
DS23-5 5 HEAD AMP SW
DS23-6 6
DS23-7 7 EXCEPT REC 5V
DS23-8 8 PICTURE CTL
DS23-9 9 EE 5V
DS23-10 10 ENVE DETECT
DS23-11 11 V·LOCK·PULSE
DS23-12 12 ART·H·SYNC
DS23-13 13 REC 5V
DS23-14 14
DS23-15 15 COLOR SW Ⓛ
DS23-16 16 GND
TP8004
0.2V/20μsec. div. 0.4Vp-p
G
F
E
D
C
B
A
1
2
3
4
5
6
7
8
9
10
11
12
13
EXCEPT REC 5V
E-E 5V
VSS
REG 5V
CURR. EMPH Ⓛ
DELAYED REC 9V
SECAM Ⓗ
IC3004
VCR0096
Q1 E-E ON
Q2 PB AMP
Q3 PB ON
Q4 PB ON
Q5 E-E ON
Q6 BUFF
Q7 BUFF
L3005 100μ
Q3003
2SD636
Q3001
2SC2206
D3002 MA165
FL3005 VLF0316
R.F. PHASE COMP
FL8002 VLF0313
REC B.P.F
PB B.P.F
QR8001
DTC144A
For EG
2SC2206 × 2
Q8001
Q8002 BUFF
FL8004 VLD064
2H DELAY
L8004 15μ
QR8002
UN1217
QR8003
UN1219
Q8003
2SC2206
For EG
PB CHROMA
REC 5V
FL8003 VLF0314
C.W B.P.F
REC L.P.F
Q8004
2SB641
Q8007
2SD636
D8002 MA165
Q8005
2SD636
L3007 470μ
L3008 27μ
L3006 82μ
L3009 150μ
L8001 100μ
EXCEPT REC 5V
IC3002
VCR0090
Q3 REC AMP
Q4 REC AMP
Q5 OFF
Q6 REC ON
Q7 REC ON
Q8 REC OFF
Q9 REC ON
Q10 REC ON
Q13 EXCEPT REC ON
Q14 EXCEPT REC ON
Q15 REC ON
Q16 REC ON
IC8001
VEFC009
AN6375
AMP
PB BURST +6dB
REC BURST +6dB
MAIN BM
REC AMP
PB AMP
VCO
ACC
ACC DET
R/P DET
KILLER P. COMP
SCHMIDT
APC P. COMP
30° SHIFTER
X-TAL VCO
BURST GATE DET
SUB BM
PAL/SECAM MODE DET
VCO FREQ
REC CURR
GND
VCC
MN61613AS
BG PULSE
V-GATE
M.M
FST
DPC PC
INV
4fc GATE
1/4
H-OUT
1/32
1/2
D-PLL
FREQ DET
AFC P-AMP
L8002 47μ
X8001 VSX0132
TP8003
FOR EG ONLY
D8001 MA165
L8003 100μ
REG 5V
ROTALY CTL
SECAM Ⓗ
BG PULSE
REC CHROMA
HEAD SW
HEAD AMP SW
PICTURE CTL
V.LOCK PULSE
ART.V.SYNC
IC3003
AN3310K
H.A
HEAD SW
AMP DET
ENV SELECT
SW
PEAKING
AGC AMP
DET
Q3002
2SC2206
L3012 150μ
L3011 15μ
L3004 470μ
EXCEPT REC 5V
REC 5V
PB CHROMA
REG 5V
E-E 5V
V-LOCK PULSE
PICTURE CTL
FL8001 VLF0315
PB L.P.F
L8005 680μ

Back Page:
MAIN Section



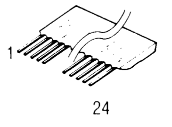
MODE
5.06MHz PHASE ROTATIONAL SIGNAL IN REC MODE
5.06MHz PHASE ROTATIONAL SIGNAL IN PLAYBACK MODE
IC3001
VEFY007
AN3215S
AN3320S
IC3002
VCR0090
IC8501
BA7025L
Q8006
2SC2206
QR8004
DTC124A
QR8005
UN1212
QR3002
UN1217
P32 TO VIDEO HEAD
TO CHROMIANCE
P8501
J1 REC 5V 1
J2 PB CHROMA 2
J2 (GND) GND 3
J4 REC CHROMA 4
J4 (GND) GND 5
J6 SECAM Ⓗ 6
J7 BG. PULSE 7
J8 REG 5V 8
SECAM C.B (VEP03201A) FOR EG ONLY
12
13
14
15
16
17
18
19
20

NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE IN THE BRACKETS ON THIS DIAGRAM IS RECORD MODE WITH PAL COLOUR SIGNAL
THE MEASUREMENT MODE OF THE DC VOLTAGE OUT OF THE BRACKETS ON THIS DIAGRAM IS PLAYBACK MODE WITH PAL COLOUR SIGNAL.
(THE VOLTAGES OF THE PARTS FOR EG ARE MEASURED WITH SECAM COLOUR SIGNAL).

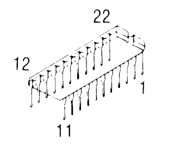
LUMINANCE & CHROMINANCE SCHEMATIC	
Transistor	
Q3001	E-3
Q3002	B-11
Q3003	E-3
Q8001	F-6
Q8002	F-7
Q8003	F-7
Q8004	E-8
Q8005	D-9
Q8006	B-14
Q8007	D-7
Transistor & Resistor	
QR3002	B-16
QR8001	G-6
QR8002	F-6
QR8003	F-6
QR8004	B-15
QR8005	B-15
Integrated Circuit	
IC3001	F-17
IC3002	E-12
IC3003	C-11
IC3004	F-3
IC8001	C-6
IC8501	B-18
Test Point	
TP3001	C-11
TP3002	F-5
TP3007	D-11
TP3009	G-11
TP3010	F-13
TP3011	F-13
TP3012	G-15
TP3013	E-2
TP8003	B-5
TP8004	B-5
TP8008	A-19
TP8501	A-19
TP GND	E-2
Adjustment	
C3031	D-10
C3032	D-11
C3035	D-11
C3036	D-12
VR3001	F-9
VR3005	D-12
VR3006	D-12
VR3007	D-11
VR3008	D-11
T8501	A-19
Connector	
P32	D-20
P33	B-1
P34	F-1
P8501	A-17

ADDRESS INFORMATION

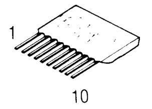
ICs & TRANSISTORs INFORMATION



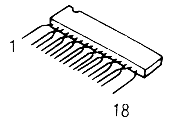
VCR0090



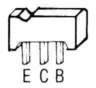
AN3310K



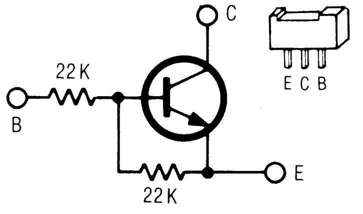
VCR0096



BA7025L

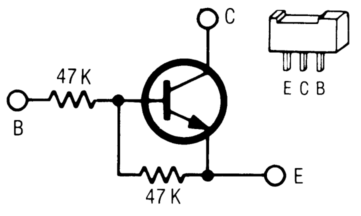


2SC2206
2SD636
2SB641



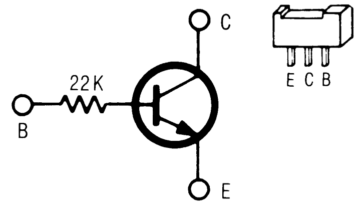
C
22K
B
22K
E
E C B

DTC124A



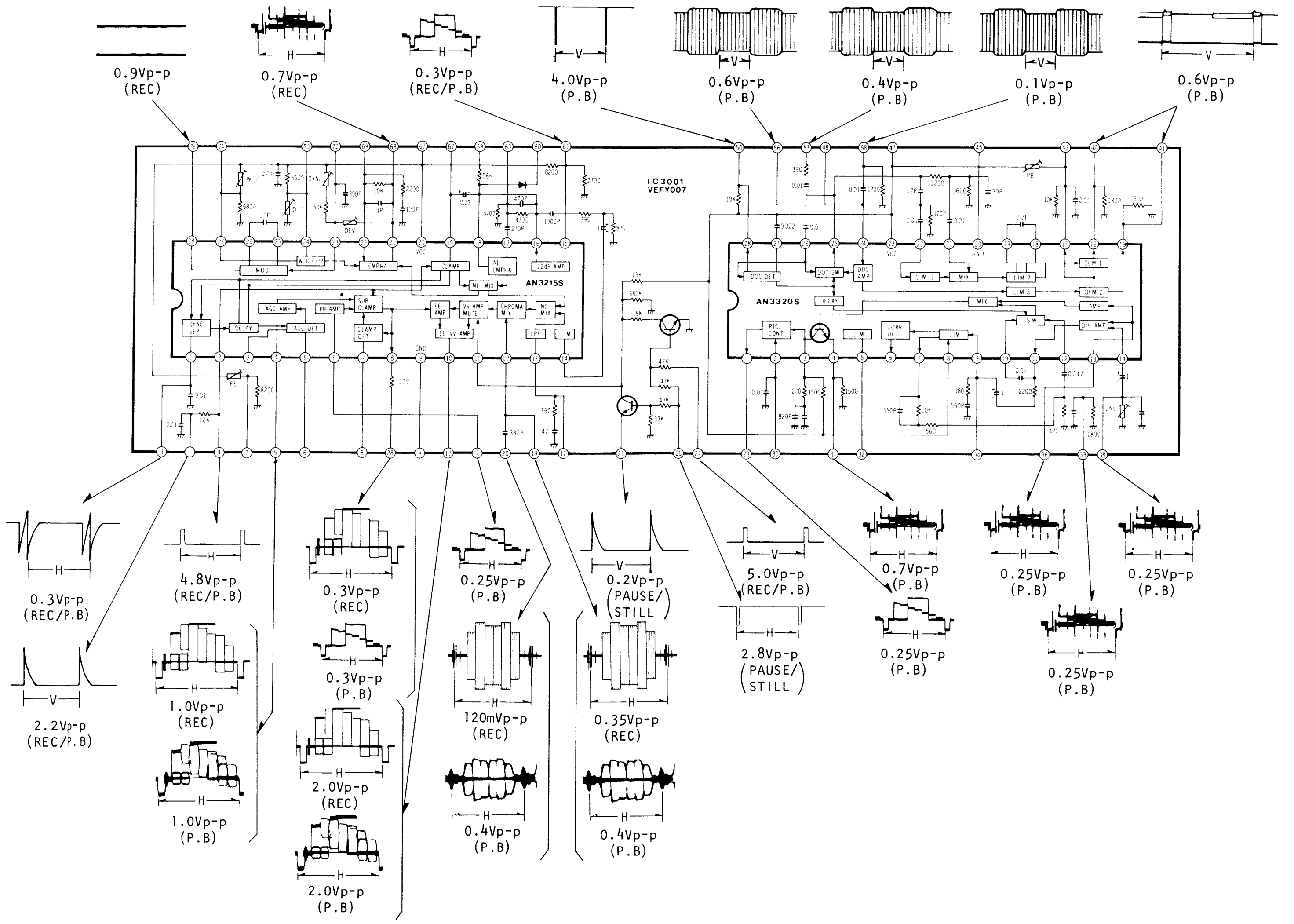
C
47K
B
47K
E
E C B

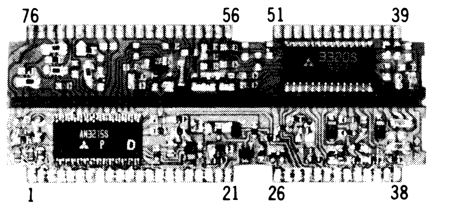
DTC144A



UN1217

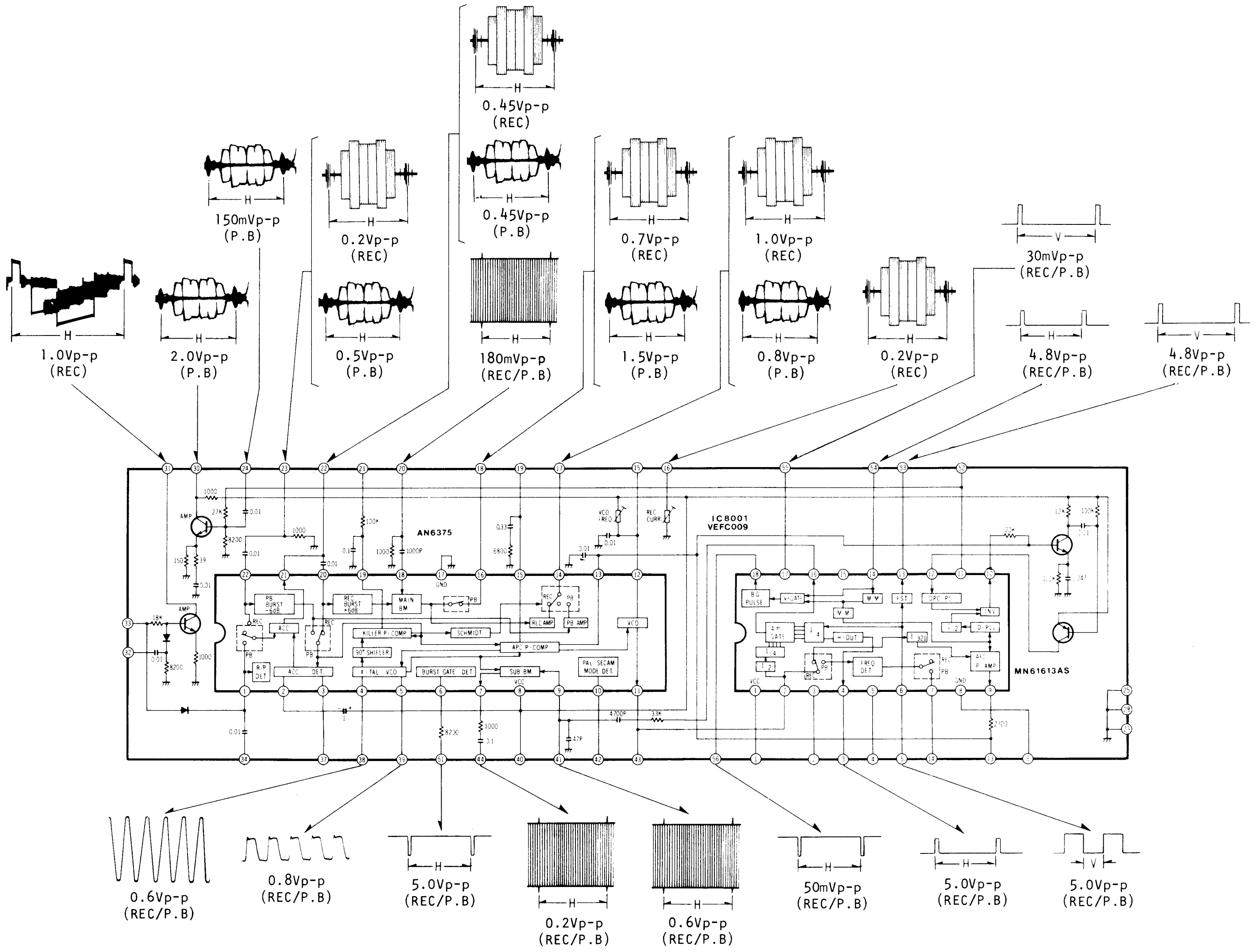
VEFY007

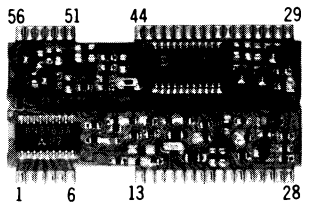

0.9Vp-p (REC)
0.7Vp-p (REC)
0.3Vp-p (REC/P.B)
4.0Vp-p (P.B)
0.6Vp-p (P.B)
0.4Vp-p (P.B)
0.1Vp-p (P.B)
0.6Vp-p (P.B)
IC3001 VEFY007
AN3215S
AN3320S
0.3Vp-p (REC/P.B)
2.2Vp-p (REC/P.B)
4.8Vp-p (REC/P.B)
1.0Vp-p (REC)
1.0Vp-p (P.B)
0.3Vp-p (REC)
0.3Vp-p (P.B)
2.0Vp-p (REC)
2.0Vp-p (P.B)
0.25Vp-p (P.B)
120mVp-p (REC)
0.4Vp-p (P.B)
0.2Vp-p (PAUSE/STILL)
0.35Vp-p (REC)
0.4Vp-p (P.B)
5.0Vp-p (REC/P.B)
2.8Vp-p (PAUSE/STILL)
0.7Vp-p (P.B)
0.25Vp-p (P.B)
0.25Vp-p (P.B)
0.25Vp-p (P.B)
0.25Vp-p (P.B)
0.25Vp-p (P.B)


76
56
51
39
AN3215S
3320S
1
21
26
38

VEFY007

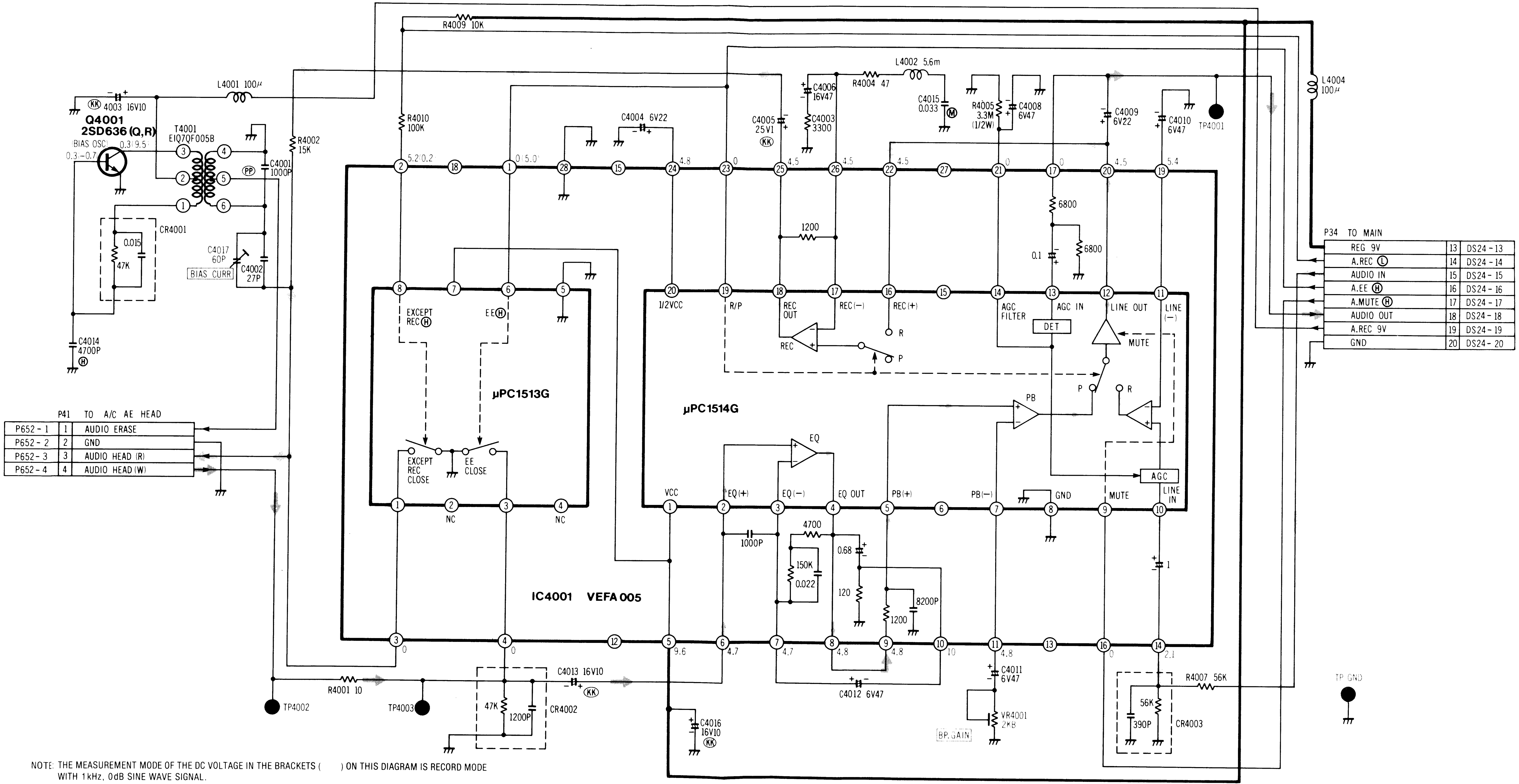
VEFC009


0.45Vp-p (REC)
0.45Vp-p (P.B)
150mVp-p (P.B)
0.2Vp-p (REC)
0.5Vp-p (P.B)
180mVp-p (REC/P.B)
0.7Vp-p (REC)
1.5Vp-p (P.B)
1.0Vp-p (REC)
0.8Vp-p (P.B)
0.2Vp-p (REC)
30mVp-p (REC/P.B)
1.0Vp-p (REC)
2.0Vp-p (P.B)
4.8Vp-p (REC/P.B)
4.8Vp-p (REC/P.B)
IC8001 VEFC009
AN6375
MN61613AS
0.6Vp-p (REC/P.B)
0.8Vp-p (REC/P.B)
5.0Vp-p (REC/P.B)
0.2Vp-p (REC/P.B)
0.6Vp-p (REC/P.B)
50mVp-p (REC/P.B)
5.0Vp-p (REC/P.B)
5.0Vp-p (REC/P.B)


56
51
44
29
1
6
13
28

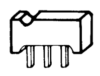
VEFC009

3-14. AUDIO SCHEMATIC DIAGRAM

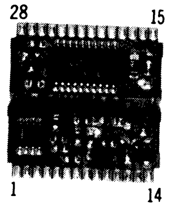

R4009 10K
L4001 100μ
4003 16V10
Q4001
2SD636 (Q,R)
BIAS OSC
T4001
EI07QF005B
R4002 15K
R4010 100K
C4001 1000P
CR4001
0.015
47K
C4017 60P
BIAS CURR
C4002 27P
C4014 4700P
C4004 6V22
C4005 25V1
C4006 16V47
C4003 3300
R4004 47
L4002 5.6m
C4015 0.033
R4005 3.3M (1/2W)
C4008 6V47
C4009 6V22
C4010 6V47
TP4001
L4004 100μ
1200
6800
0.1
6800
EXCEPT REC
EE
μPC1513G
EXCEPT REC CLOSE
EE CLOSE
NC
NC
1/2VCC
R/P
REC OUT
REC(−)
REC(+)
AGC FILTER
AGC IN
LINE OUT
LINE (−)
DET
MUTE
REC
R
P
μPC1514G
PB
EQ
AGC
VCC
EQ(+)
EQ(−)
EQ OUT
PB(+)
PB(−)
GND
MUTE
LINE IN
1000P
4700
0.68
150K
0.022
120
8200P
1200
1
IC4001 VEFA 005
P34 TO MAIN
REG 9V
A.REC Ⓛ
AUDIO IN
A.EE Ⓗ
A.MUTE Ⓗ
AUDIO OUT
A.REC 9V
GND
13 DS24-13
14 DS24-14
15 DS24-15
16 DS24-16
17 DS24-17
18 DS24-18
19 DS24-19
20 DS24-20
P41 TO A/C AE HEAD
P652-1 1 AUDIO ERASE
P652-2 2 GND
P652-3 3 AUDIO HEAD (R)
P652-4 4 AUDIO HEAD (W)
R4001 10
TP4002
TP4003
C4013 16V10
47K
1200P
CR4002
C4016 16V10
C4012 6V47
C4011 6V47
VR4001 2KB
BP. GAIN
R4007 56K
56K
390P
CR4003
TP GND

NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE IN THE BRACKETS ( ) ON THIS DIAGRAM IS RECORD MODE WITH 1kHz, 0dB SINE WAVE SIGNAL.
THE MEASUREMENT MODE OF THE DC VOLTAGE OUT OF THE BRACKETS ON THIS DIAGRAM IS PLAYBACK MODE WITH 1kHz, 0dB SINE WAVE SIGNAL.

ICs & TRANSISTORs INFORMATION



2SD636



MAIN SIGNAL PATH IN REC MODE

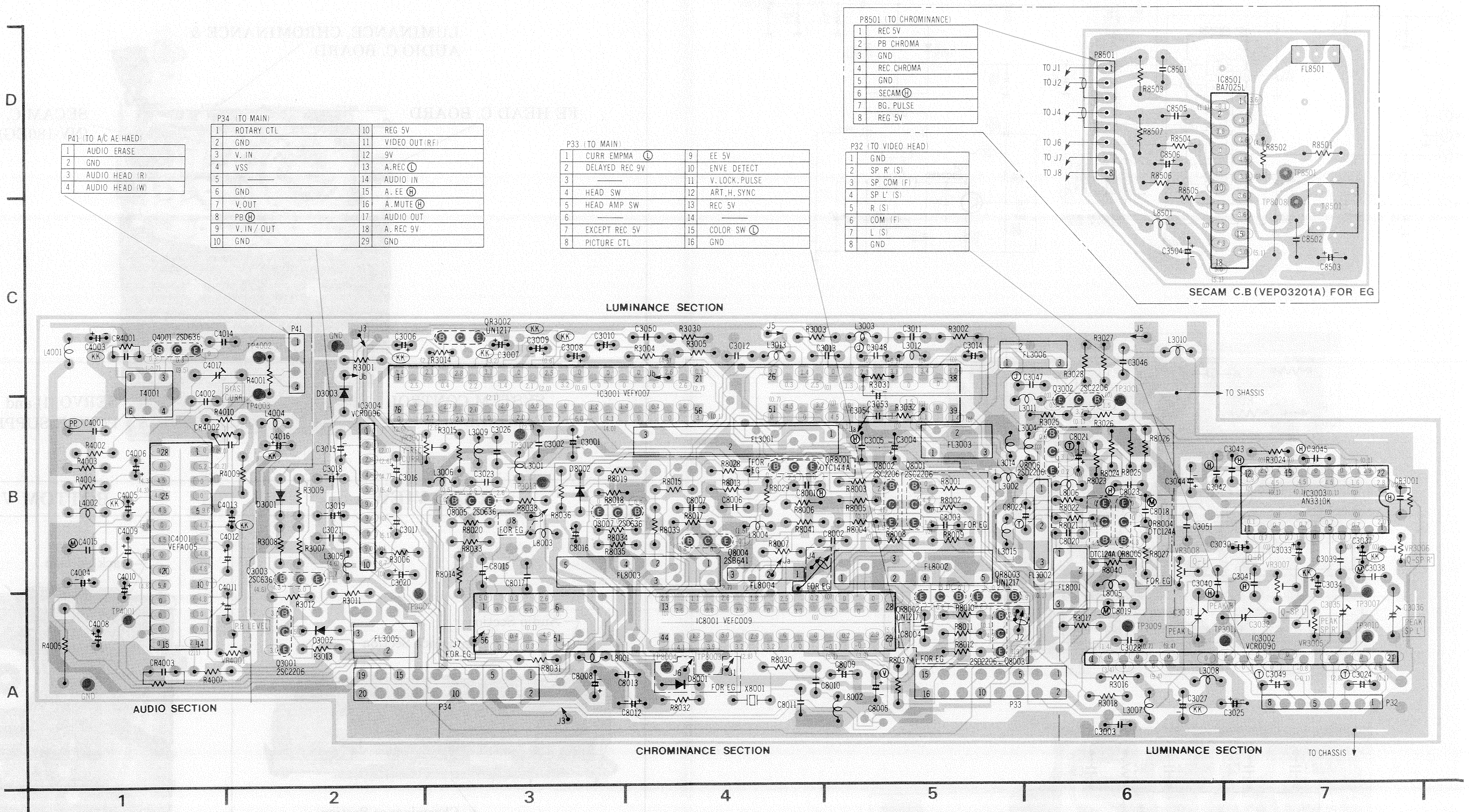
⇐ MAIN SIGNAL PATH IN PLAYBACK MODE

Back Page:
LUMINANCE, CHROMINANCE Section

3-15. LUMINANCE, CHROMINANCE & AUDIO CIRCUIT BOARD (VEP03200A: NV-180E/B)/(VEP03200B: NV-180EG) /SECAM CIRCUIT BOARD (VEP03201A)

LUMINANCE CHROMINANCE & AUDIO CIRCUIT BOARD	
Transistor	
Q3001	A-2
Q3002	C-6
Q3003	B-2
Q4001	C-1
Q8001	B-5
Q8002	B-5
Q8003	A-5
Q8004	B-4
Q8005	B-3
Q8006	B-6
Q8007	B-3
Transistor & Resistor	
QR3002	C-3
QR8001	B-5
QR8002	A-5
QR8003	A-5
QR8004	B-6
QR8005	B-6
Integrated Circuit	
IC3001	C-3
IC3002	A-7
IC3003	B-7
IC3004	B-2
IC4001	B-1
IC8001	A-4
IC8501	D-6
Test Point	
TP3001	C-6
TP3002	A-2
TP3007	B-7
TP3009	A-6
TP3010	B-7
TP3011	A-6
TP3012	B-3
TP3013	B-3
TP4001	A-1
TP4002	C-2
TP4003	C-2
TP8003	A-4
TP8004	A-4
TP8008	D-7
TP8501	D-7
TP GND	C-2
TP GND	A-1
Adjustment	
C3031	A-6
C3032	A-7
C3035	B-7
C3036	B-7
C4017	C-1
VR3001	B-2
VR3005	A-7
VR3006	B-7
VR3007	B-7
VR3008	B-6
VR4001	A-2
T8501	D-7

ADDRESS INFORMATION


D
C
B
A
1
2
3
4
5
6
7
LUMINANCE SECTION
AUDIO SECTION
CHROMINANCE SECTION
LUMINANCE SECTION
TO CHASSIS
TO CHASSIS
SECAM C.B (VEP03201A) FOR EG
P8501
IC8501
BA7025L
FL8501
TO J1
TO J2
TO J4
TO J6
TO J7
TO J8
IC3001 VEFY007
IC8001 VEFC009
IC4001 VEFA005
IC3003 AN3310K
IC3002 VCR0090
IC3004 VCR0096
P41
P34
P33
P32
FOR EG

P41 (TO A/C AE HAED)

1	AUDIO ERASE
2	GND
3	AUDIO HEAD (R)
4	AUDIO HEAD (W)

P34 (TO MAIN)

1	ROTARY CTL	10	REG 5V
2	GND	11	VIDEO OUT(RF)
3	V. IN	12	9V
4	VSS	13	A.REC Ⓛ
5	———	14	AUDIO IN
6	GND	15	A. EE Ⓗ
7	V. OUT	16	A. MUTE Ⓗ
8	PB Ⓗ	17	AUDIO OUT
9	V. IN/ OUT	18	A. REC 9V
10	GND	29	GND

P33 (TO MAIN)

1	CURR EMPMA Ⓛ	9	EE 5V
2	DELAYED REC 9V	10	ENVE DETECT
3	———	11	V. LOCK. PULSE
4	HEAD SW	12	ART. H. SYNC
5	HEAD AMP SW	13	REC 5V
6	———	14	———
7	EXCEPT REC 5V	15	COLOR SW Ⓛ
8	PICTURE CTL	16	GND

P8501 (TO CHROMINANCE)

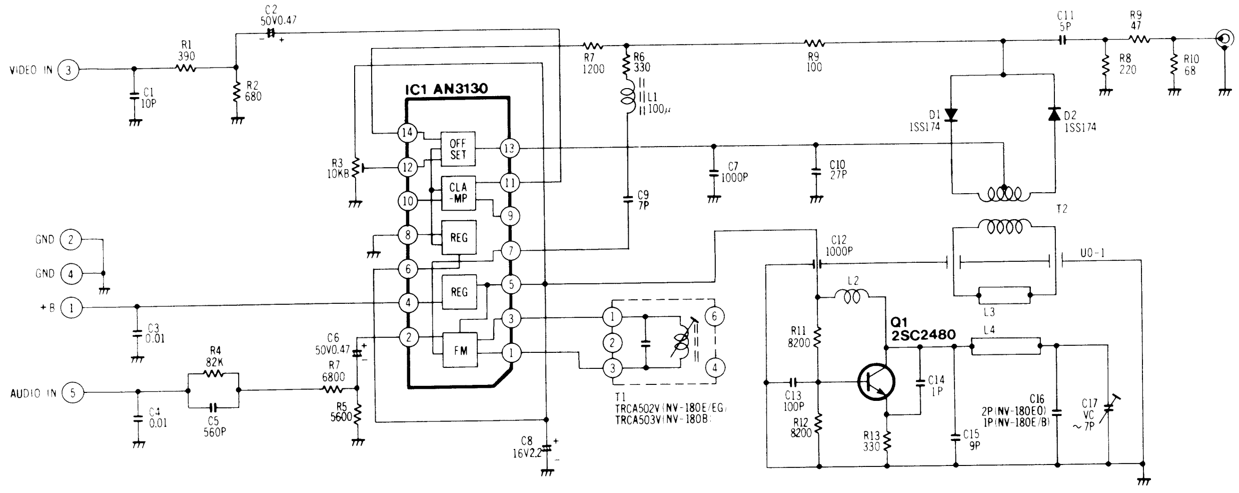
1	REC 5V
2	PB CHROMA
3	GND
4	REC CHROMA
5	GND
6	SECAM Ⓗ
7	BG. PULSE
8	REG 5V

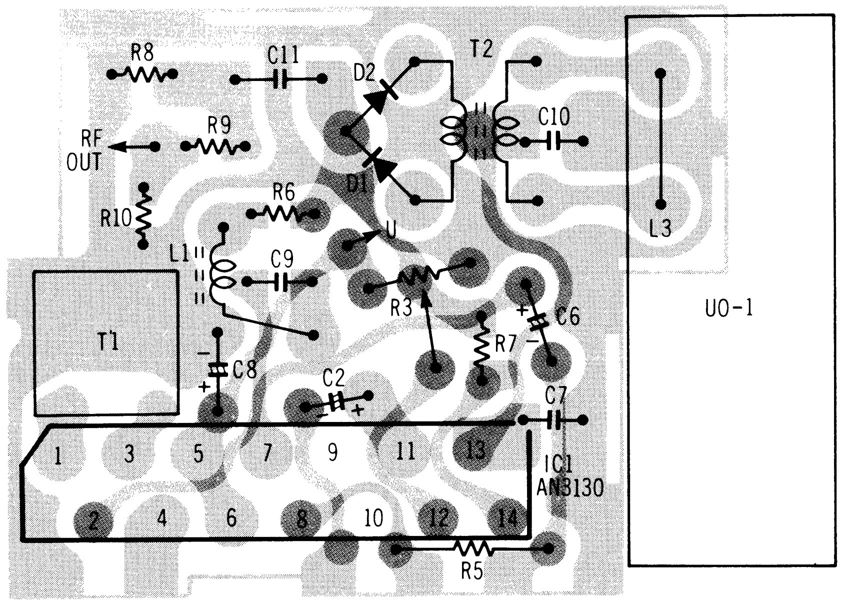
P32 (TO VIDEO HEAD)

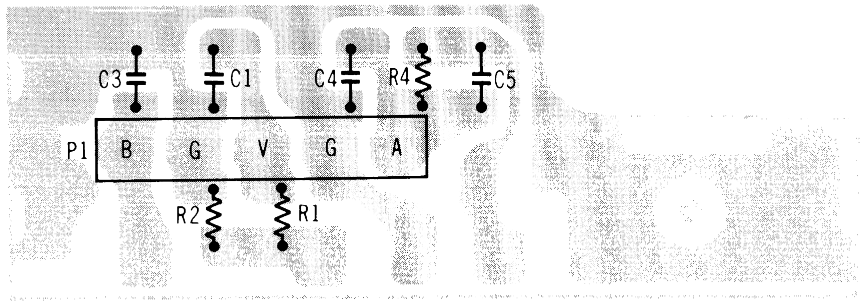
1	GND
2	SP R' (S)
3	SP COM (F)
4	SP L' (S)
5	R (S)
6	COM (F)
7	L (S)
8	GND

3-16. RF CONVERTER SCHEMATIC DIAGRAM & CIRCUIT BOARD

—UNIT No. ENC17751— —UNIT No. ENC17752—


VIDEO IN ③
GND ②
GND ④
+B ①
AUDIO IN ⑤
IC1 AN3130
OFF SET
CLA MP
REG
REG
FM
T1 TRCA502V(NV-180E/EG) TRCA503V(NV-180B)
Q1 2SC2480
D1 1SS174
D2 1SS174
T2
L1 100μ
L2
L3
L4
UO-1
RF OUT
C1 10P
C2 50V0.47
C3 0.01
C4 0.01
C5 560P
C6 50V0.47
C7 1000P
C8 16V2.2
C9 7P
C10 27P
C11 5P
C12 1000P
C13 100P
C14 1P
C15 9P
C16 2P(NV-180E(G)) 1P(NV-180E(B))
C17 VC ~7P
R1 390
R2 680
R3 10KB
R4 82K
R5 5600
R6 330
R7 1200
R7 6800
R8 220
R9 47
R9 100
R10 68
R11 8200
R12 8200
R13 330

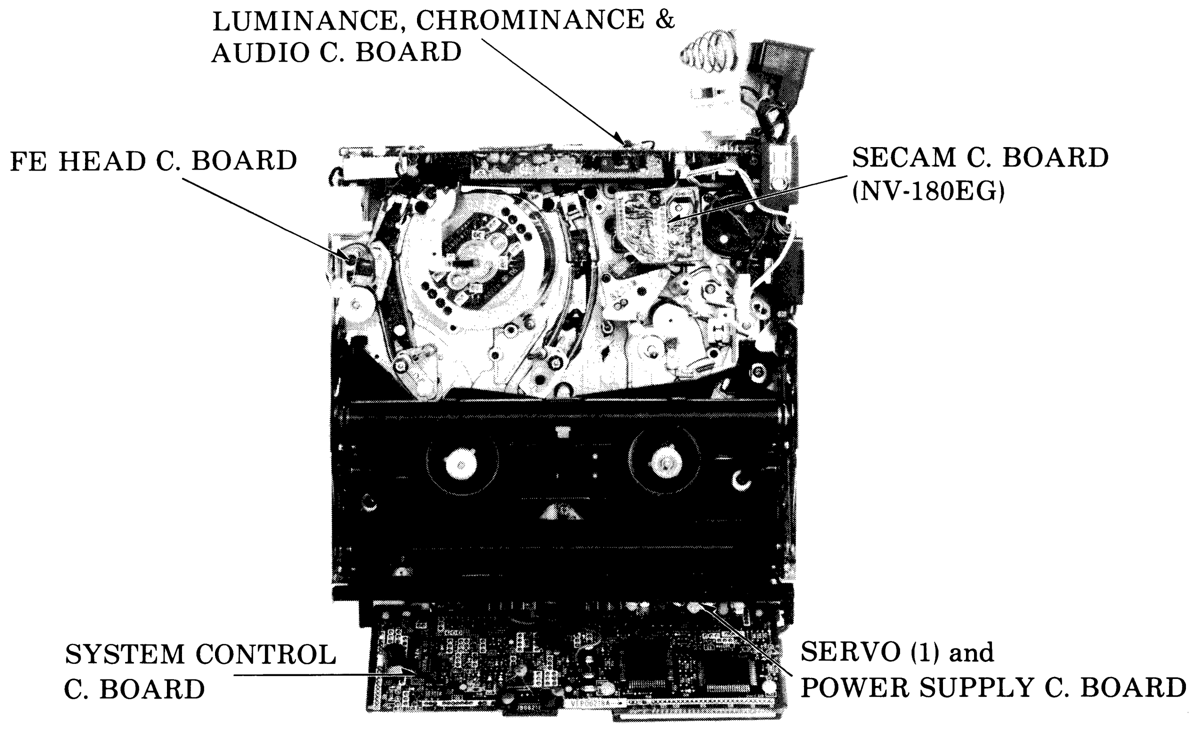

R8
C11
D2
T2
RF OUT
R9
C10
R10
R6
D1
L1
C9
R3
C6
T1
R7
C8
C2
C7
IC1 AN3130
1
3
5
7
9
11
13
2
4
6
8
10
12
14
R5
L3
UO-1


C3
C1
C4
R4
C5
P1
B
G
V
G
A
R2
R1

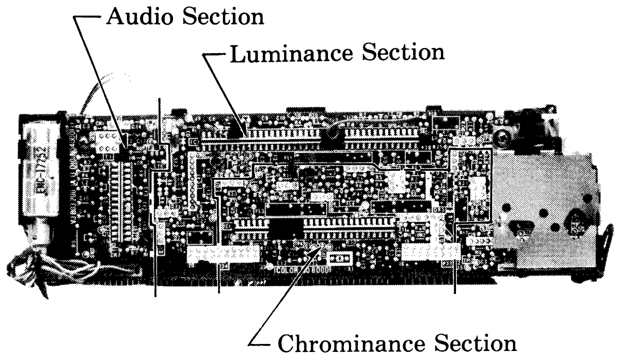
Back Page:
LUMINANCE, CHROMINANCE &
AUDIO Section

3-17. CIRCUIT BOARD LAYOUT

TOP VIEW

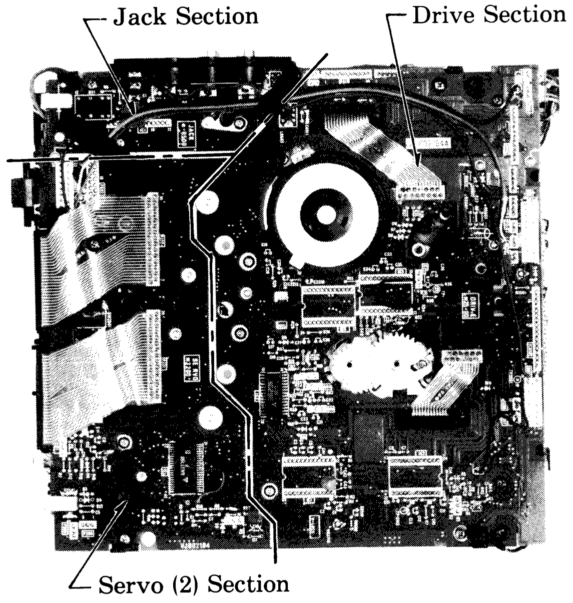

LUMINANCE, CHROMINANCE & AUDIO C. BOARD
FE HEAD C. BOARD
SECAM C. BOARD (NV-180EG)
SYSTEM CONTROL C. BOARD
SERVO (1) and POWER SUPPLY C. BOARD

REAR VIEW


Audio Section
Luminance Section
Chrominance Section

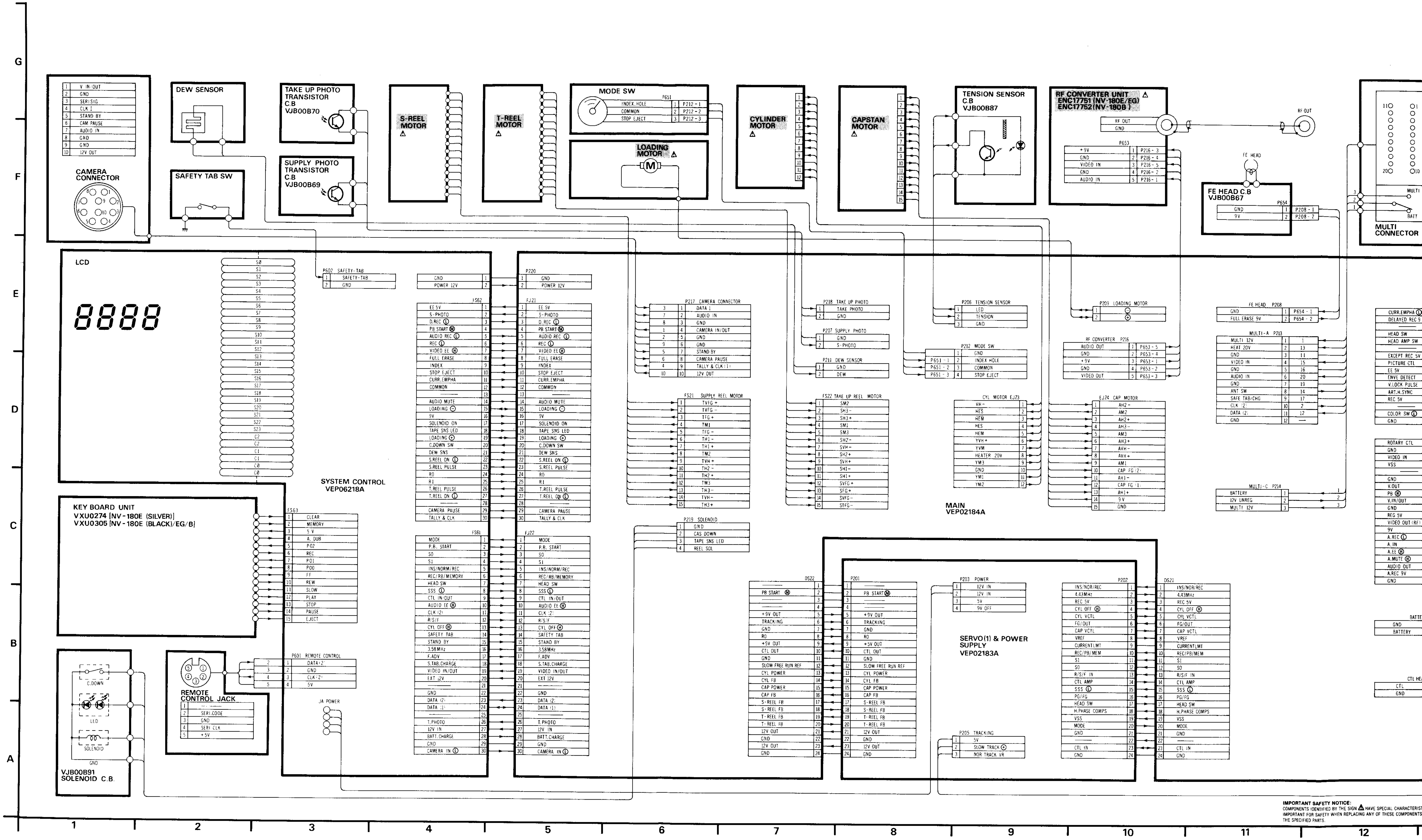
[LUMINANCE, CHROMINANCE & AUDIO C. BOARD]

BOTTOM VIEW


Jack Section
Drive Section
Servo (2) Section

[MAIN C. BOARD]

3-18. INTERCONNECTION SCHEMATIC DIAGRAM



G
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CAMERA CONNECTOR
DEW SENSOR
SAFETY TAB SW
TAKE UP PHOTO TRANSISTOR C.B VJB00B70
SUPPLY PHOTO TRANSISTOR C.B VJB00B69
S-REEL MOTOR
T-REEL MOTOR
MODE SW
LOADING MOTOR
CYLINDER MOTOR
CAPSTAN MOTOR
TENSION SENSOR C.B VJB00B87
RF CONVERTER UNIT ENC17751 (NV-180E/EG) ENC17752 (NV-180B)
RF OUT
FE HEAD
FE HEAD C.B VJB00B67
MULTI CONNECTOR
LCD
8888
SYSTEM CONTROL VEP06218A
KEY BOARD UNIT VXU0274 [NV-180E (SILVER)] VXU0305 [NV-180E (BLACK)/EG/B]
REMOTE CONTROL JACK
VJB00B91 SOLENOID C.B.
C.DOWN
LED
SOLENOID
MAIN VEP02184A
SERVO(1) & POWER SUPPLY VEP02183A
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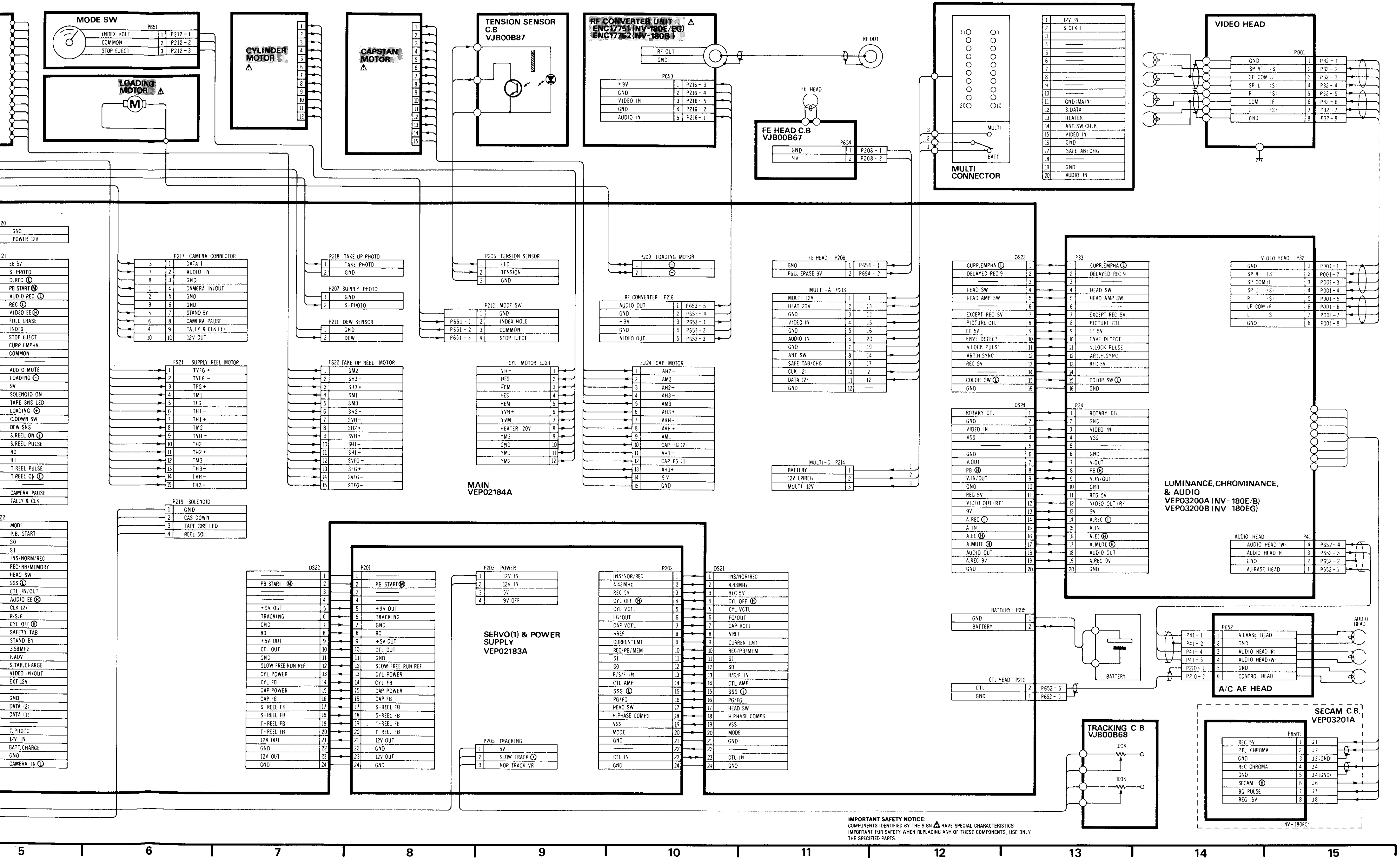
IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED BY THE SIGN ⚠ HAVE SPECIAL CHARACTERIST
IMPORTANT FOR SAFETY WHEN REPLACING ANY OF THESE COMPONENTS
THE SPECIFIED PARTS.


MODE SW
LOADING MOTOR ⚠
CYLINDER MOTOR ⚠
CAPSTAN MOTOR ⚠
TENSION SENSOR C.B VJB00B87
RF CONVERTER UNIT ⚠ ENC17751 (NV-180E/EG) ENC17762 (NV-180B)
RF OUT
FE HEAD
FE HEAD C.B VJB00B67
MULTI CONNECTOR
VIDEO HEAD
MAIN VEP02184A
SERVO(1) & POWER SUPPLY VEP02183A
LUMINANCE, CHROMINANCE, & AUDIO VEP03200A (NV-180E/B) VEP03200B (NV-180EG)
BATTERY
A/C AE HEAD
AUDIO HEAD
TRACKING C.B. VJB00B68
SECAM C.B. VEP03201A
(NV-180EG)
P217 CAMERA CONNECTOR
P218 TAKE UP PHOTO
P207 SUPPLY PHOTO
P211 DEW SENSOR
P206 TENSION SENSOR
P212 MODE SW
P209 LOADING MOTOR
RF CONVERTER P216
FE HEAD P208
MULTI-A P213
MULTI-C P214
FS21 SUPPLY REEL MOTOR
FS22 TAKE UP REEL MOTOR
CYL MOTOR EJ23
EJ24 CAP MOTOR
P219 SOLENOID
DS22
P201
P203 POWER
P205 TRACKING
P202
DS21
DS23
P33
DS24
P34
VIDEO HEAD P32
AUDIO HEAD P41
BATTERY P215
CTL HEAD P210
P652
P8501
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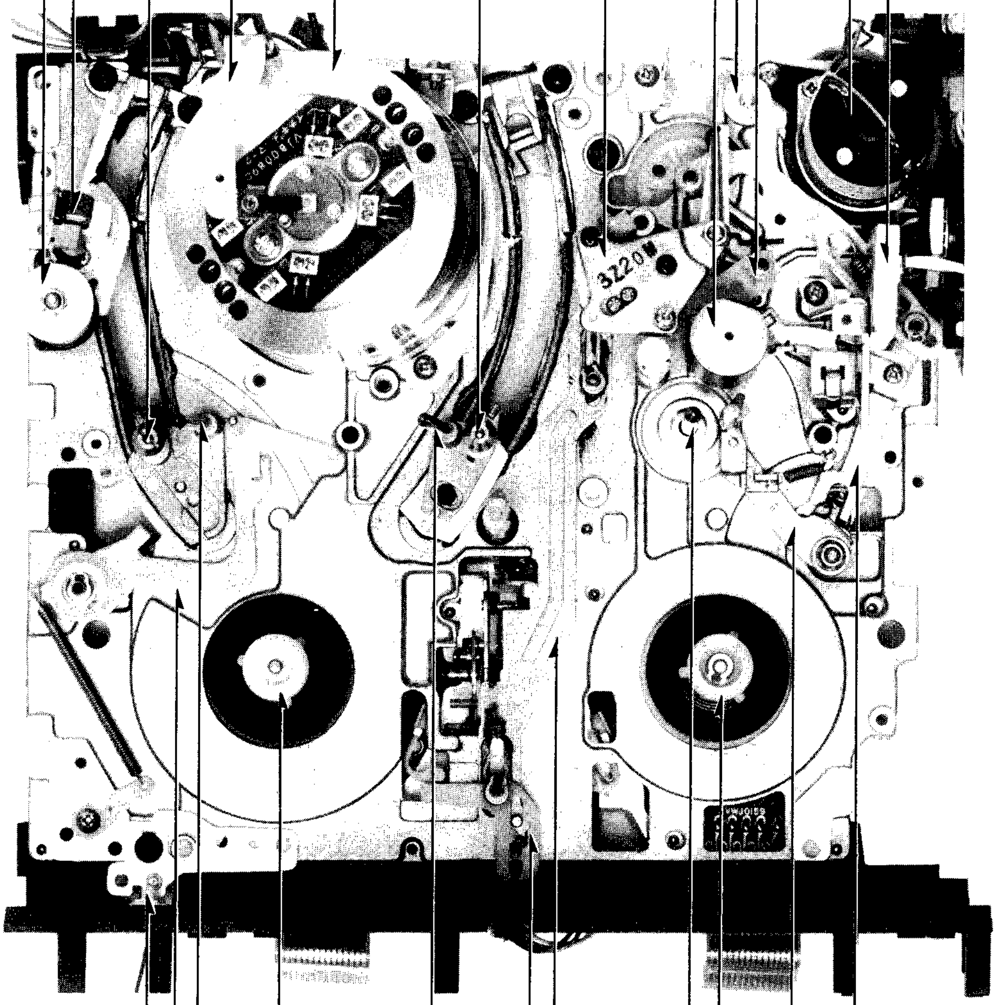
IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED BY THE SIGN ⚠ HAVE SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SPECIFIED PARTS.

SECTION 4
EXPLODED VIEWS AND PARTS LIST

4-1. INNER PARTS LOCATION

TOP VIEW



Roller Post Unit (T) (VXP0302C)

Upper Cylinder Unit (VEH0252)

Earth Plate Unit (VSX0060)

Roller Post Unit (S) (VXP0302)

FE Head (VBS0031)

Limitter Roller (VDP0970)

A/C Head Arm (VML1567)
A/C Head (VEH0237)

Pressure Roller Unit (VXL1229)

Adjust Nut (VHN0039)

Brake Arm Unit (VXL1198)

Loading Motor Unit (VEM0207)

Dew Sensor Unit (VEK2119)

Safety Tab Switch (VSH0023)

Tension Arm Unit (VXL1200)

Inclind Base (S) Unit (VXA2039)

Supply Reel Table Unit (VXR0122)

Inclind Base (T) Unit (VXA2041)

Brake Cam (VDK0009)

P5 Kick Lever (VML1565)

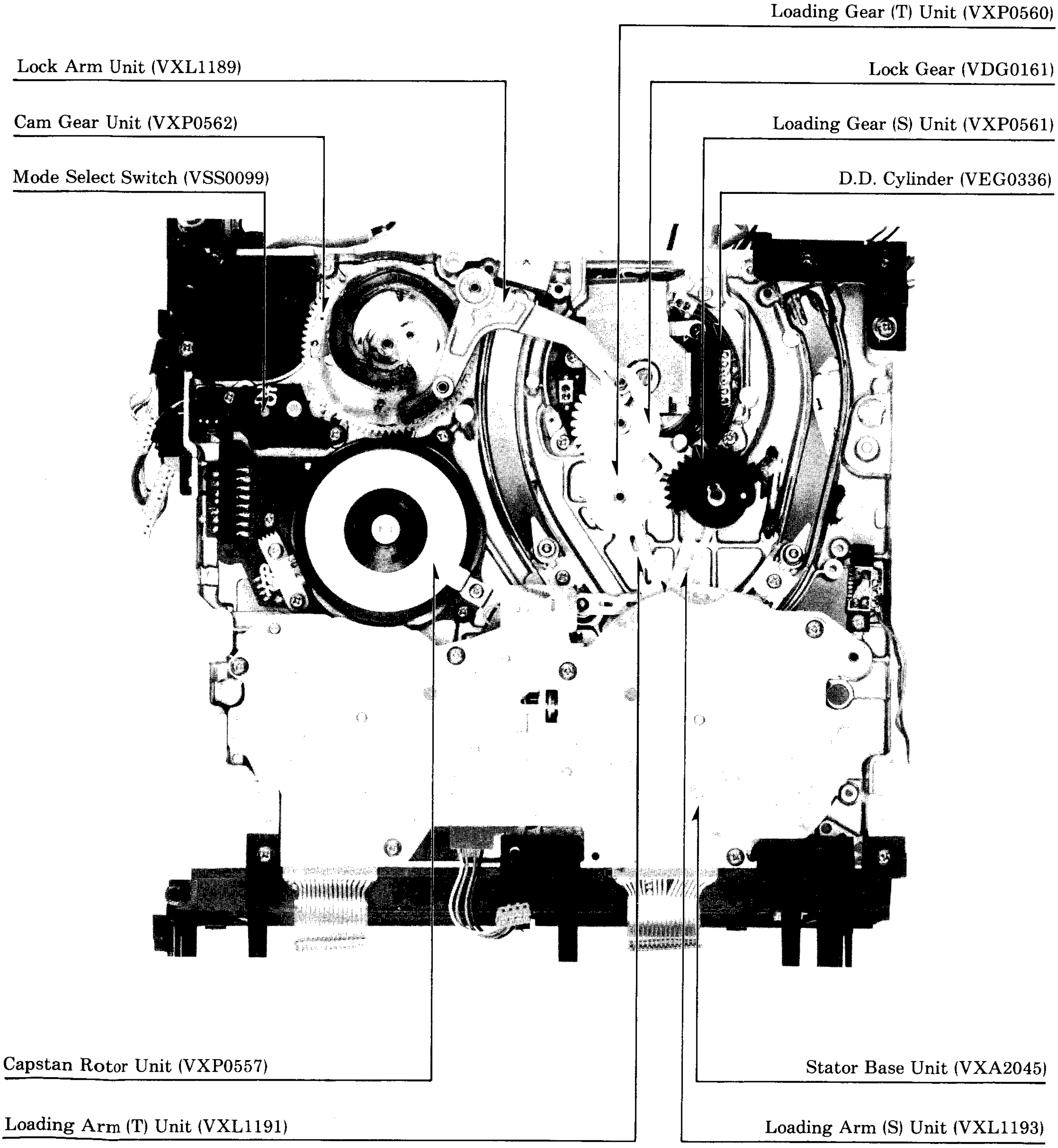
P5 Arm Unit (VXL1196)

Take-up Reel Table Unit (VXR0121)

Capstan Rotor Unit (VXP0557)

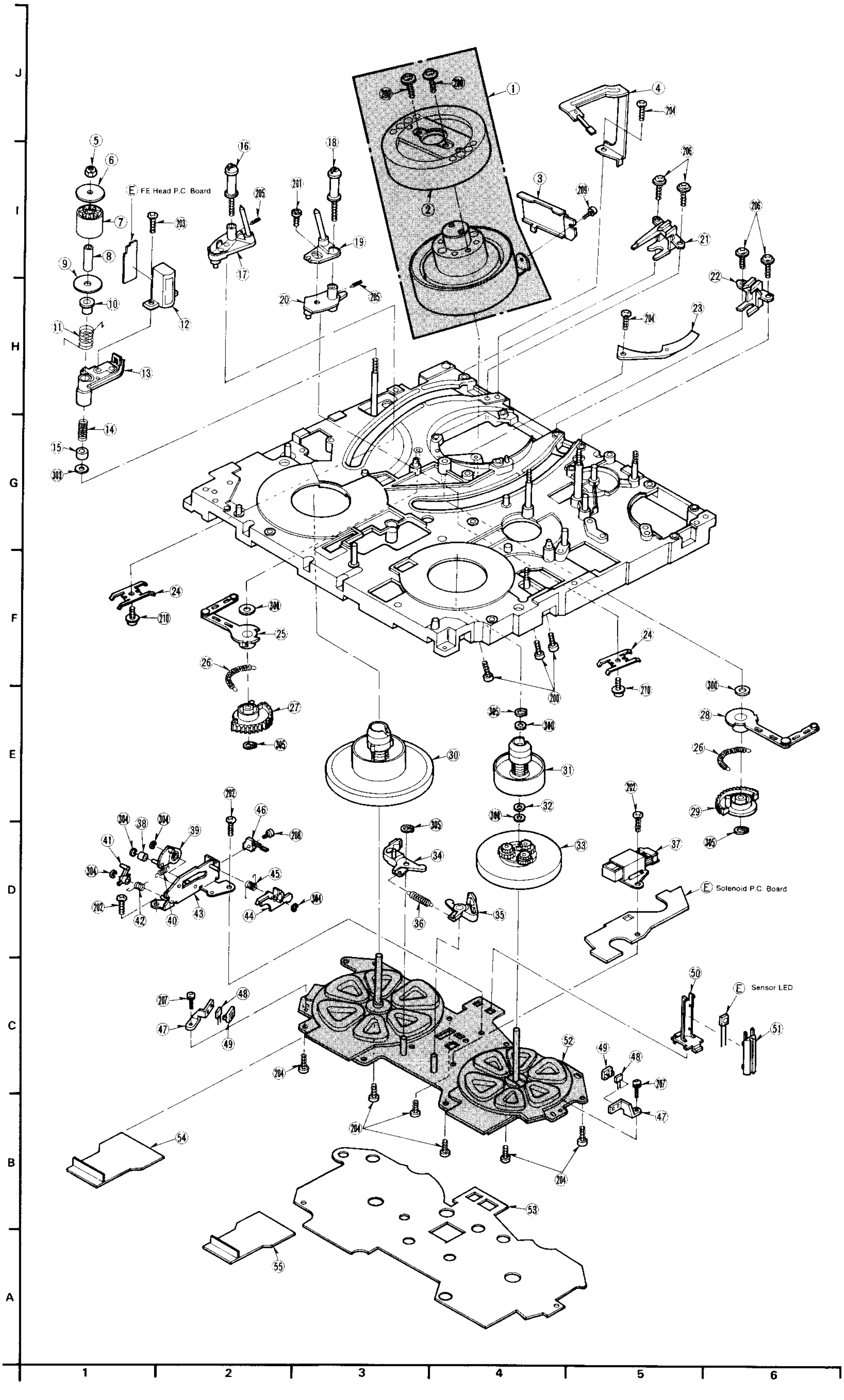
Main Rod Unit (VXL1199)

BOTTOM VIEW


Loading Gear (T) Unit (VXP0560)
Lock Arm Unit (VXL1189)
Lock Gear (VDG0161)
Cam Gear Unit (VXP0562)
Loading Gear (S) Unit (VXP0561)
Mode Select Switch (VSS0099)
D.D. Cylinder (VEG0336)
Capstan Rotor Unit (VXP0557)
Stator Base Unit (VXA2045)
Loading Arm (T) Unit (VXL1191)
Loading Arm (S) Unit (VXL1193)

4-2. EXPLODED VIEW

❶ TRANSPORT SECTION



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E FE Head P.C. Board
E Solenoid P.C. Board
E Sensor LED
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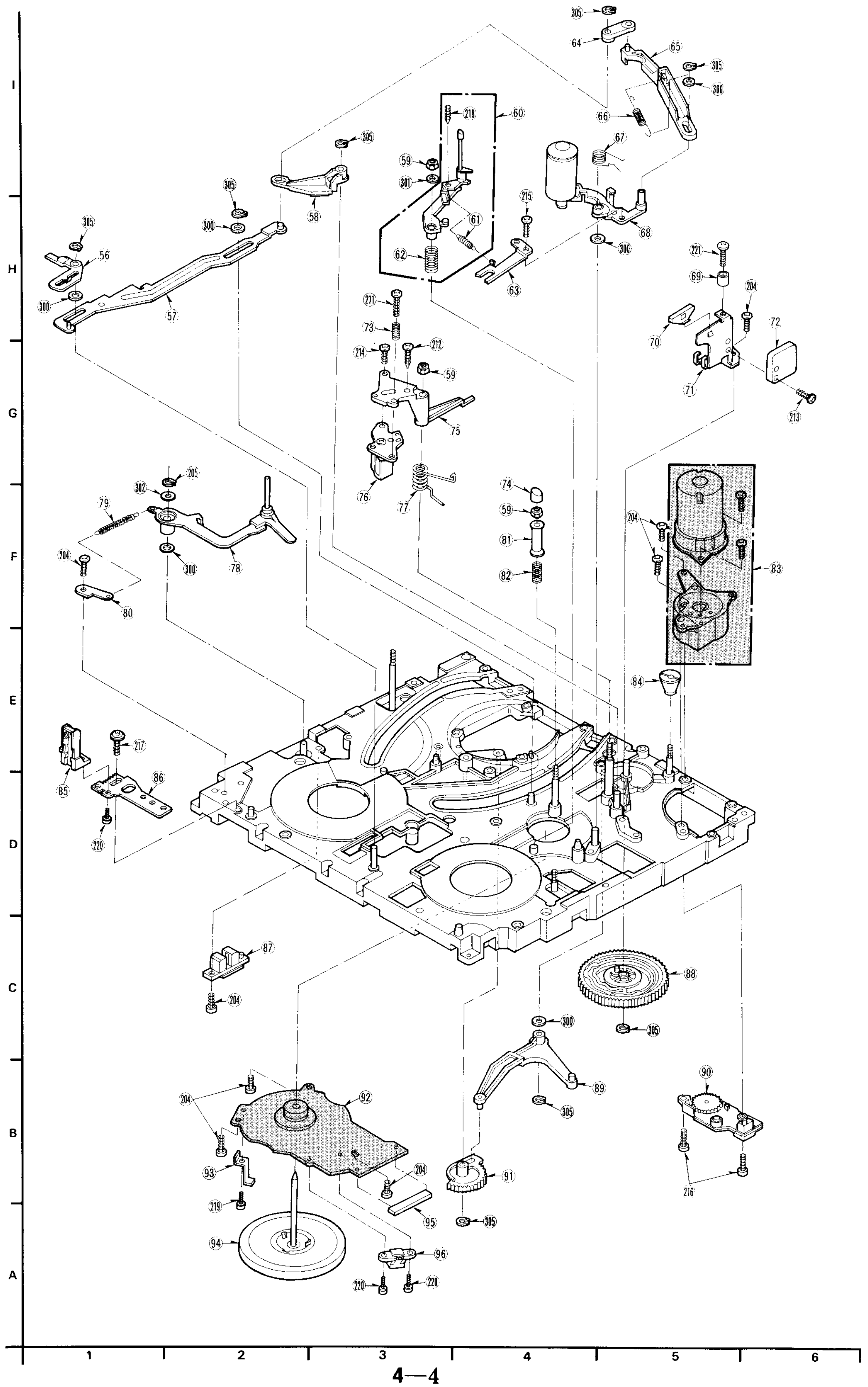
❷ MOVING MECHANISM SECTION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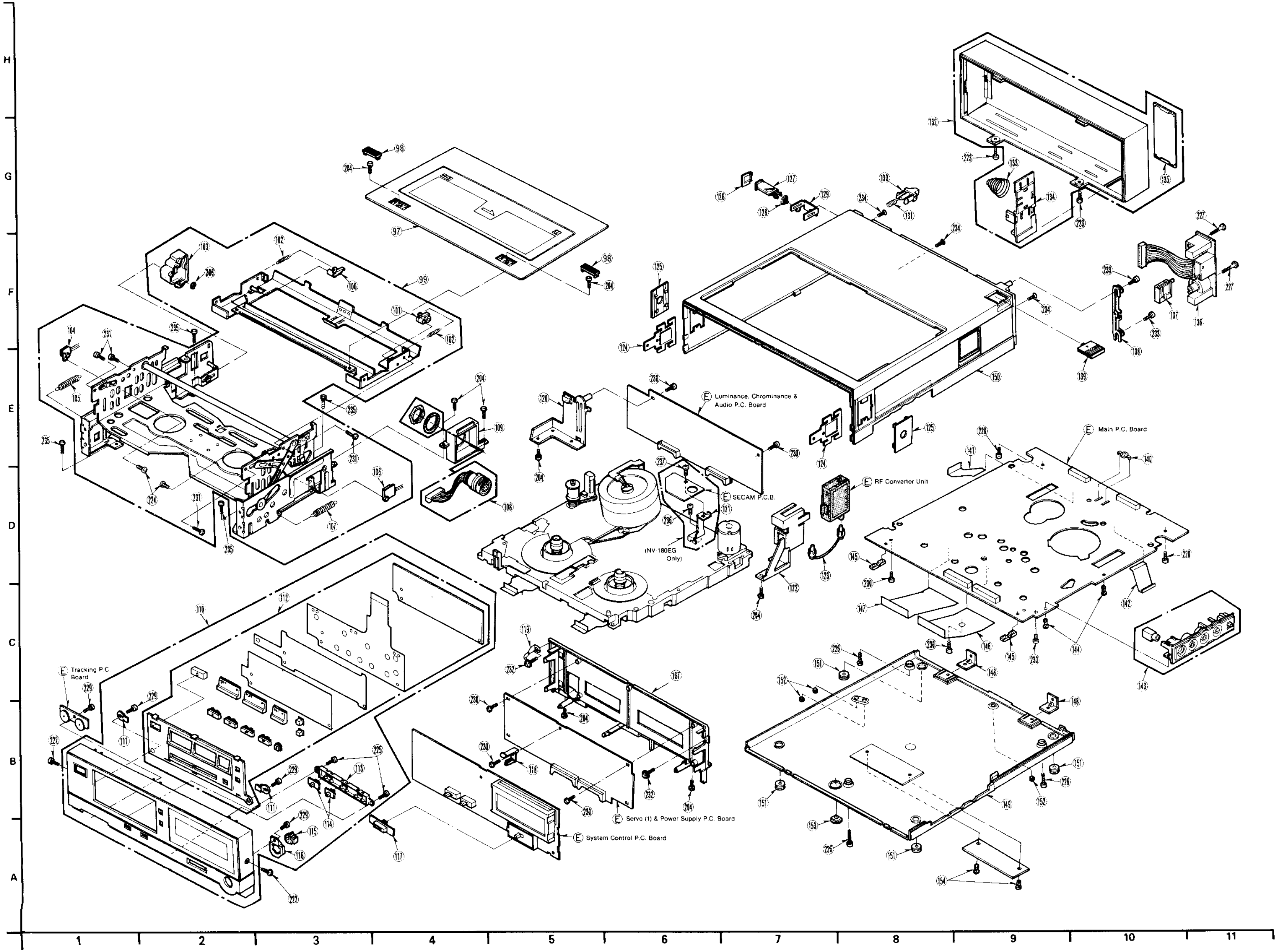
❸ CHASSIS PARTS, CASSETTE UP MECHANISM & CASING PARTS SECTION


E Luminance, Chrominance & Audio P.C. Board
E SECAM P.C.B.
(NV-180EG Only)
E RF Converter Unit
E Main P.C. Board
E Tracking P.C. Board
E Servo (1) & Power Supply P.C. Board
E System Control P.C. Board
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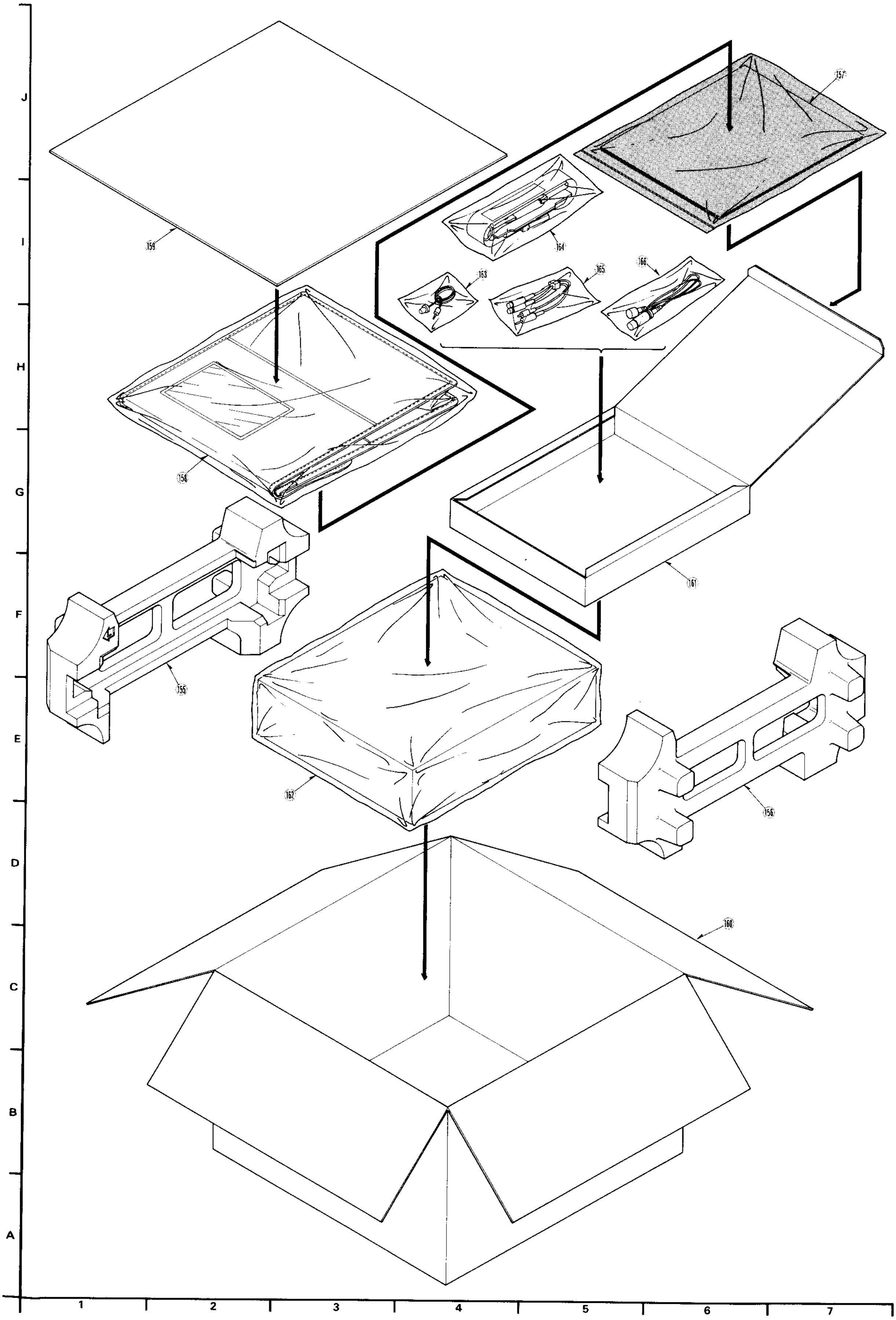
❹ PACKING PARTS SECTION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4-3. MECHANICAL REPLACEMENT PARTS LIST

Notes: 1. * Be sure to make your orders of replacement parts according to this list.
2. IMPORTANT SAFETY NOTICE
Components identified with the mark ⚠ have the special characteristics for safety. When replacing any of these components, use only the same type.

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
1(1)	VEG0336	Cylinder Unit	1	⚠
2(1)	VEH0252	Upper Cylinder Unit	1	
3(1)	VSC1142	Shield Board	1	
4(1)	VSX0060	Earth Plate Unit	1	
5(1)	VHN0023	Nut	1	
6(1)	VMX0692	Upper Limiter	1	
7(1)	VDP0970	Limiter Roller	1	
8(1)	VMX0288	Collar (B)	1	
9(1)	VMX0679	Lower Limiter	1	
10(1)	VDB0721	Limiter Stand	1	
11(1)	VMB1231	FE Head Lever Spring	1	
12(1)	VBS0031	FE Head	1	
13(1)	VML1569	FE Head Lever	1	
14(1)	VMB1239	Limiter Spring	1	
15(1)	VMX0680	Collar (A)	1	
16(1)	VXP0302A	Roller Post Unit (S)	1	
17(1)	VXA2039	Inclind Base (S) Unit	1	
18(1)	VXP0302C	Roller Post Unit (T)	1	
19(1)	VXA2041	Inclind Base (T) Unit	1	
20(1)	VXA2042	Shaft Holder (T) Unit	1	
21(1)	VMD0613	Post Stopper (S)	1	
22(1)	VMD0614	Post Stopper (T)	1	
23(1)	VMD0609	Inclind Support	1	
24(1)	VMA6422	Shaft Holder Plate	2	
25(1)	VXL1193	Loading Arm (S) Unit	1	
26(1)	VMB1232	Loading Spring	2	
27(1)	VXP0561	Loading Gear (S) Unit	1	
28(1)	VXL1191	Loading Arm (T) Unit	1	
29(1)	VXP0560	Loading Gear (T) Unit	1	
30(1)	VXR0122	Supply Reel Table Unit	1	
31(1)	VXR0121	Takeup Reel Table Unit	1	
32(1)	VMX0708D	Thrust Washer	1	
33(1)	VXP0564	Takeup Rotor Unit	1	
34(1)	VXZ0173	Main Brake (S) Unit	1	
35(1)	VXZ0174	Main Brake (T) Unit	1	
36(1)	VMB1241	Brake Spring	1	
37(1)	VJJ0066	Keep Solenoid	1	
38(1)	VDP0969	Lock Roller	1	
39(1)	VXA2035	Lock Board Unit	1	
40(1)	VMB1227	Lock Board Spring	1	
41(1)	VML1562	Lock Lever (B)	1	
42(1)	VMB1225	Lock Lever (B) Spring	1	
43(1)	VXA2034	Lock Plate Unit	1	
44(1)	VML1561	Lock Lever (A)	1	
45(1)	VMB1226	Lock Lever (A) Spring	1	
46(1)	VSH0019	Reef Switch	1	
47(1)	VMD0611	FG Support (1)	2	
48(1)	HW-300B	Hall IC	2	
49(1)	VMD0621	FG Support (2)	2	
50(1)	VMX0682	LED Holder (R)	1	
51(1)	VMX0683	LED Holder (L)	1	
52(1)	VXA2045	Stator Base Unit	1	⚠
53(1)	VMZ0565	Insulate Sheet	1	
54(1)	VWJ0158	Supply Reel Motor FPC	1	
55(1)	VWJ0159	Takeup Reel Moter FPC	1	
56(2)	VDK0009	Brake Cam	1	
57(2)	VXL1199	Main Rod Unit	1	
58(2)	VXL1198	Brake Arm Unit	1	
59(2)	VHN0023	Nut	3	
60(2)	VXL1196	P5 Arm Unit	1	
61(2)	VMB1237	Pin Pressure Spring	1	
62(2)	VMB1299	P5 Spring	1	
63(2)	VML1565	P5 Kick Lever	1	
64(2)	VML1563	Guide Lever	1	
65(2)	VMM0130	Pinch Rod	1	
66(2)	VMB1228	Pressure Spring	1	
67(2)	VMB1238	Pinch Arm Spring	1	
68(2)	VXL1229	Pressure Roller Unit	1	
69(2)	VDB0740	Stopper Boss	1	
70(2)	VMA6413	Opener Cover	1	
71(2)	VMA6421	Opener Angle	1	
72(2)	VEK2119	Dew Sensor Unit	1	
73(2)	VMB0935	Adjust Spring	1	
74(2)	VMD0619	P4 Post Cap	1	
75(2)	VML1567	A/C Head Arm	1	
76(2)	VEH0237	A/C Head	1	
77(2)	VMB1240	A/C Head Height Spring	1	
78(2)	VXL1200	Tension Arm Unit	1	
79(2)	VMB1230	Tension Arm Spring	1	
80(2)	VMD0604	Tension Arm Spring Tie (C)	1	
81(2)	VMX0681	Post Sleeve	1	
82(2)	VMB1239	Limiter Spring	1	
83(2)	VEM0207	Loading Motor Unit	1	⚠
84(2)	VHN0039	Adjust Nut	1	
85(2)	VSH0023	Safety Tab Switch	1	
86(2)	VMA6414	Safety Tab Base	1	
87(2)	VEK2116	Tension Sensor Unit	1	
88(2)	VXP0562	Cam Gear Unit	1	
89(2)	VXL1189	Lock Arm Unit	1	
90(2)	VSS0099	Mode Select SW	1	
91(2)	VDG0161	Lock Gear	1	
92(2)	VEK2113	Capstan Stator Unit	1	⚠
93(2)	VMA6470	Stopper	1	
94(2)	VXP0557	Capstan Rotor Unit	1	
95(2)	VJS1403	Capstan Stator Connector	1	
96(2)	VBK0041	MR. FG Sensor	1	
97(3)	VGP1002	Cassette Cover	1	NV-180E(Silver)
97(3)	VGP1051	Cassette Cover	1	NV-180E(Black)/EG/B
98(3)	VGK1212	Cassette Cover Cap	2	NV-180E(Silver)
98(3)	VGK1222	Cassette Cover Cap	2	NV-180E(Black)/EG/B
99(3)	VXA2037	Cassette Compartment Unit	1	
100(3)	VXL1225	Cassette Pressure Lever (L)	1	
101(3)	VXL1226	Cassette Pressure Lever (R)	1	
102(3)	VMB1222	Cassette Support Spring	2	
103(3)	VDG0169	Damper	1	
104(3)	VXA2121	Supply Photo Tr Unit	1	
105(3)	VMB1224	Holder Spring (L)	1	
106(3)	VXA2122	Takeup Photo Tr Unit	1	
107(3)	VMB1223	Holder Spring (R)	1	
108(3)	VEK2118	Camera Connector Unit	1	
109(3)	VJH0295	Camera Terminal	1	
110(3)	VYP0980	Front Panel Unit	1	NV-180E(Silver)
110(3)	VYP1065	Front Panel Unit	1	NV-180E(Black)/EG/B
111(3)	VMA6402	Key Board Support Angle	2	
112(3)	VXU0274	Key Board Unit	1	NV-180E(Silver)
112(3)	VXU0305	Key Board Unit	1	NV-180E(Black)/EG/B
113(3)	VGQ0664	Mode Select Knob Angle	1	
114(3)	VGU1170	Mode Select Knob	2	NV-180E(Silver)
114(3)	VGU1571	Mode Select Knob	2	NV-180E(Black)/EG/B
115(3)	VEK2123	Remote Control Jack Unit	1	
116(3)	VGQ0608	Remote Control Jack Mount Angle	1	
117(3)	VGU1292	Power Switch Button Unit	1	
118(3)	VJF0188	P. C. Board Support Piece	1	
119(3)	VMC0055	Earth Spring (A)	1	
120(3)	VMD0600	Back Frame (L)	1	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
121(3)	VMA6489	SECAM P. C. Board Angle	1	NV-180EG
122(3)	VMD0599	Back Frame (R)	1	
123(3)	VEE0991	RF Converter Cable Unit	1	
124(3)	VMA6401	Belt Support Angle	2	
125(3)	VGK1211	Belt Holder	2	
126(3)	VGU1348	Battery Eject Button (A)	1	
127(3)	VGQ0614	Battery Eject Button (B)	1	
128(3)	VMB1220	Battery Eject Spring	1	
129(3)	VMA6400	Eject Button Angle	1	
130(3)	VGQ0609	Battery Stopper	1	
131(3)	VMB1221	Battery Stopper Spring	1	
132(3)	VYK0690	Battery Case Unit	1	NV-180E(Silver)
132(3)	VYK0763	Battery Case Unit	1	NV-180E(Black)/EG/B
133(3)	VMB1219	Battery Spring	1	
134(3)	VJF0189	Battery Catcher	1	
135(3)	VYF0443	Multi Door Unit	1	
136(3)	VEK2195	Multi Connector Unit	1	
137(3)	VEK2192	Multi Switch Unit	1	
138(3)	VMP0450	Multi Jack Angle	1	
139(3)	VKF0332	RF Converter Cover	1	NV-180E(Silver)
139(3)	VKF0426	RF Converter Cover	1	NV-180E(Black)/EG/B
140(3)	VMX0699	Spacer	1	
141(3)	VWJ0157	Main Board FPC (A)	1	
142(3)	VWJ0155	Main Board FPC (B)	1	
143(3)	VEJ0330	Jack Board Unit	1	
144(3)	VHN0011	Rivet	2	
145(3)	VKC0124	Hinge	2	
146(3)	VWJ0161	Main Board FPC (C)	1	
147(3)	VWJ0160	Main Board FPC (D)	1	
148(3)	VMA6399	Bottom Case Angle	2	
149(3)	VKM0347	Bottom Case	1	
150(3)	VKM0267	Top Case	1	NV-180E(Silver)
150(3)	VKM0346	Top Case	1	NV-180E(Black)/EG/B
151(3)	VKA0038	Foot Rubber	4	
152(3)	VMG0312	Rubber Cap (A)	3	
153(3)	VMG0318	Rubber Cap (B)	1	
154(3)	VHN0030	Rivet	2	
155(4)	VPN0984	Cushion (L)	1	
156(4)	VPN0983	Cushion (R)	1	
157(4)	VQF1203	Fan Bag Kit	1	NV-180E ⚠
157(4)	VQF1204	Fan Bag Kit	1	NV-180EG ⚠
157(4)	VQF1205	Fan Bag Kit	1	NV-180B ⚠
158(4)	VFC0032	Carrying Case	1	NV-180E(Silver)
158(4)	VFC0036	Carrying Case	1	NV-180E(Black)/EG/B
159(4)	VPN1095	Upper Cushion	1	
160(4)	VPG1663	Packing Case	1	NV-180E(Silver)
160(4)	VPG1769	Packing Case	1	NV-180E(Black)
160(4)	VPG1664	Packing Case	1	NV-180EG
160(4)	VPG1665	Packing Case	1	NV-180B
161(4)	VPK0360	Accessory Case	1	
162(4)	VPF0210	Polyethylene Bag	1	
163(4)	VBE0003	Earphone	1	
164(4)	VFB0053	Shoulder Belt	1	
165(4)	VJP1431	Audio Cable	1	
166(4)	VJA0130	DIN-RF Cable	2	
167(3)	VMD0598	Front Frame	1	
		Screws		
200(1)	VHD0081		5	
201(1)	VHD0162		1	
202(1,2)	XSN26+4		3	
203(1)	XTN26+6G		1	
204(1,2,3)	XTV26+6F		24	
205(1)	XXEV0004		2	
206(1)	XYE26+BF8FZ		4	
207(1)	XYN2+C4		2	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
208(1)	XYN2+E6		1	
209(1)	XYN2+F5		1	
210(1)	XYN26+F5		1	
211(2)	VHD0077		1	
212(2)	VHD0144		1	
213(2)	XSN26+8		1	
214(2)	XSN26+8FZ		1	
215(2)	XSN26+4		1	
216(2)	XTV26+8F		2	
217(2)	XYE26+BF6FZ		1	
218(2)	XYE2C3FP		1	
219(2)	XYN26+C4		1	
220(2)	XYN26+C5		3	
221(2)	XTN26+10F		1	
222(3)	XTB26+4FFC		2	NV-180E(Silver)
222(3)	XTB26+4FFZ		2	NV-180E(Black)/EG/B
223(3)	XTB26+4FFZ		2	
224(3)	XTN2+6G		2	
225(3)	XTS23+6J		2	
226(3)	XTV26+10FFZ		4	
227(3)	XTV26+12FFZ		2	
228(3)	XTV26+6FR		2	
229(3)	XTV26+6J		4	
230(3)	XTV26+6JR		8	
231(3)	XYN26+C6		4	
232(3)	XYN26+F6		2	
233(3)	XTV26+6S		2	
234(3)	XSS26+5		3	
235(3)	XYE26+BF8		4	
236(3)	XTV26+6F		1	NV-180EG
237(3)	XTV26+6FR		1	NV-180EG
		Washers & Rings		
300(1,2)	XWGV3D6G		11	
301(2)	XWGV3D5G		1	
302(2)	XWGV3D7G		1	
303(1)	XUC15FP		4	
304(1,2)	XUEV3VW		13	
305(3)	XUC25FP		1	

4-4. ELECTRICAL REPLACEMENT PARTS LIST

Notes: 1. * Be sure to make your orders of replacement parts according to this list.
2. IMPORTANT SAFETY NOTICE
Components identified with the mark ⚠ have the special characteristics for safety. When replacing any of these components, use only the same type.
3. Unless otherwise specified,
All resistors are in OHMS (Ω), 1/4 W ± 5% carbon. K=1,000Ω, M=1,000 KΩ. All capacitors are in MICROFARADS (μF), ± 10% P=μμF.

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
	VEP02183A	Servo (1) & Power Supply	1	
		Board Unit		
	VEP02184A	Main [Servo (2), Drive,	1	
		Jack & Picture VR] P.C.		
		Board		
	VEP03200A	Luminance, Chrominance &	1	NV-180E/B
		Audio P.C. Board Unit		
	VEP03200B	Luminance, Chrominance &	1	NV-180EG
		Audio P.C. Board Unit		
	VEP03201A	SECAM P.C. Board Unit	1	NV-180EG
	VEP06218A	System Control P.C. Board	1	
		Unit		
	ENC17751	RF Converter Unit	1	NV-180E/EG ⚠
	ENC17152	RF Converter Unit	1	NV-180B ⚠
	VJB00B67	FE Head P.C. Board	1	
	VJB00B68	Tracking P.C. Board	1	
	VJB00B87	Tension Sensor P.C. Board	1	
	VJB00B91	Solenoid P.C. Board	1	
		Miscellaneous		
	LN59	LED Sensor	1	
	VMX0682	LED Holder (R)	1	
	VMX0683	LED Holder (L)	1	
	XBA2C20TR0	Fuse 250V 2.0A	1	⚠
	VJF0188	P.C. Board Support Piece	1	
	VJH0295	Camera Terminal	1	
	VSC1184	Head Amp Shield Case (B)	1	
	VBS0031	FE Head	1	
	VEP02183A	Servo (1) & Power Supply		
		P.C. Board Unit		
		(Power Supply Section)		
		Integrated Circuits		
IC1001	BA6149LS		1	Liner
IC1002	UN101		1	Switching ⚠
		Transistor		
Q1001	2SD992		1	(K,L,M)
		Combination Parts		
		(Transistor & Resistor)		
QR1001	DTC124A		1	or UN1212
		Diodes		
D1001-1003	MA165		3	
		Resistors		
R1002	ERDS2TJ222	2.2K	1	
R1003	ERDS2TJ103	10K	1	
R1004	ERDS2TJ222	2.2K	1	
R1005	ERDS2TJ223	22K	1	
R1006-1009	ERDS2TJ154	150K	4	
R1010	ERDS2TJ122	1.2K	1	
R1011	ERDS2TJ222	2.2K	1	
R1012,1013	ERDS2TJ122	1.2K	2	
R1014	ERDS2TJ821	820	1	
R1015	ERDS2TJ122	1.2K	1	
R1016,1017	ERDS2TJ153	15K	2	
R1019	ERDS2TJ681	680	1	
R1020	ERDS2TJ223	22K	1	
R1021	ERDS2TJ822	8.2K	1	
R1023	ERDS2TJ103	10K	1	
R1024	ERDS2TJ122	1.2K	1	
		Variable Resistor		
VR1003	EVML3GA00B14	10K	1	
		Capacitors		
C1001	ECCF1H820K	Ceramic 50V 470P	1	
C1002	ECKF1H561K	Ceramic 50V 560P	1	
C1004	ECEA1HKS010	Electrolytic 50V 1	1	
C1005,1006	ECEA1CK101	Electrolytic 16V 100	2	
C1007	VCYE1E473MR	Semiconductor 25V 0.047	1	
C1008	ECKF1H103ZF	Ceramic 50V 0.01	1	
C1010-1013	ECEA1HKS010	Electrolytic 50V 1	4	
C1014	ECEA1AK221	Electrolytic 10V 220	1	
C1015	ECKF1H221KB	Ceramic 50V 220P	1	
C1017	ECEA1AK221	Electrolytic 10V 220	1	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
C1018	ECEA0JKS330	Electrolytic 6.3V 33	1	
C1019	ECEA1AK221	Electrolytic 10V 220	1	
C1020	ECKF1H181KB	Ceramic 50V 180P	1	
C1022	ECEA1AK221	Electrolytic 10V 220	1	
C1023-1027	ECEA1CK101	Electrolytic 16V 100	5	
		Coils		
L1001	VLQ0128		1	
L1002	VLQ0129	290μH	1	
L1003	VLQ0128		1	
L1004	VLQ0129	290μH	1	
L1005	VLQ0128		1	
L1006-1009	VLQ0129	290μH	4	
		Combination Parts		
		(Capacitor & Resistor)		
CR1001	EXED561K473C	560P 47K	1	
		Crystal Oscillator		
X1001	VSX0136		1	
		(Servo (1) Section)		
		Integrated Circuits		
IC2001	AN3615K		1	
IC2002	μPC1516CA		1	
IC2003	VCR0094		1	
		Transistors		
Q2001,2002	2SA1115		2	(E,F)
Q2003	2SD636		1	(Q,R,S)
		Combination Parts		
		(Transistor & Resistor)		
QR2001,2002	DTC144A		2	or UN1213
QR2003	DTC124A		1	or UN1212
		Diode		
D2002	MA165		1	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
		Resistors		
R2001	ERDS2TJ562	5.6K	1	
R2002	ERDS2TJ273	27K	1	
R2003	ERDS2TJ272	2.7K	1	
R2004	ERDS2TJ560	56	1	
R2005	ERDS2TJ563	56K	1	
R2006	ERDS2TJ333	33K	1	
R2007,2008	ERDS2TJ154	150K	2	
R2009	ERDS2TJ124	120K	1	
R2010	ERDS2TJ222	2.2K	1	
R2011	ERDS2TJ123	12K	1	
R2012,2013	ERDS2TJ563	56K	2	
R2014	ERDS2TJ334	330K	1	
R2015	ERDS2TJ563	56K	1	
R2016,2017	ERDS2TJ332	3.3K	2	
R2018	ERDS2TJ224	220K	1	
R2019	ERDS2TJ273	27K	1	
R2020	ERDS2TJ563	56K	1	
R2021	ERDS2TJ564	560K	1	
R2022,2023	EROS2CKG2202	Metal 22K	2	
R2024	ERDS2TJ332	3.3K	1	
R2025	ERDS2TJ103	10K	1	
R2026	ERDS2TJ472	4.7K	1	
R2027	ERDS2TJ153	15K	1	
R2028,2029	ERDS2TJ103	10K	2	
R2030	ERDS2TJ470	47	1	
R2031	ERDS2TJ154	150K	1	
R2032	ERDS2TJ824	820K	1	
R2033	ERDS2TJ182	1.8K	1	
R2034	ERDS2TJ821	820	1	
R2035	ERDS2TJ152	1.5K	1	
R2036	ERDS2TJ563	56K	1	
R2038	ERDS2TJ563	56K	1	
		Variable Resistors		
VR2001,2002	EVML3GA00B15	100K	2	
VR2013	EVML3GA00B23	2K	1	
		Capacitors		
C2001	ECCF1H330K	Ceramic 50V 33P	1	
C2002	VCYE1E472MR	Semiconductor 25V 4700P	1	
C2003	ECEA1HSNR33	Electrolytic 50V 0.33	1	
C2004	ECEA0GKS470	Electrolytic 4V 47	1	
C2005	ECEA0GKS101	Electrolytic 4V 100	1	
C2006	ECEA1CKS100	Electrolytic 16V 10	1	
C2007	ECQB1H273KZ	Mylar 50V 0.027	1	
C2008,2009	ECEA0JKS101	Electrolytic 6.3V 100	2	
C2010	ECEA1HKS010	Electrolytic 50V 1	1	
C2011,2012	ECQV1H473JZ	Mylar 50V 0.047	2	
C2013	ECQB1H103KH	Mylar 50V 0.01	1	
C2014	ECQB1H472KH	Mylar 50V 4700P	1	
C2015	VCYE1C223MR	Semiconductor 16V 0.022	1	
C2016	ECEA0JKS470	Electrolytic 6.3V 47	1	
C2017	ECSF16ER27	Tantalum 16V 0.27	1	
C2018-2020	ECEA0JKS220	Electrolytic 6.3V 22	3	
C2021	VCYE1E332MR	Semiconductor 25V 3300P	1	
C2022	ECEA1HKSR47	Electrolytic 50V 0.47	1	
C2023	ECEA1HSNR33	Electrolytic 50V 0.33	1	
C2024	ECQV1H683JZ	Mylar 50V 0.068	1	
C2025	ECEA1HKS010	Electrolytic 50V 1	1	
C2026	VCYE1E472MR	Semiconductor 25V 4700P	1	
C2027	ECEA1CKS100	Electrolytic 16V 10	1	
C2028	ECEA1HSNR33	Electrolytic 50V 0.33	1	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
C2029	ECEA1HKS010	Electrolytic 50V 1	1	
C2030	ECQB1H103KH	Mylar 50V 0.01	1	
C2031	VCYE1C473MR	Semiconductor 16V 0.047	1	
C2032	ECQB1H562KH	Mylar 50V 5600P	1	
C2033	ECEA0JKS101	Electrolytic 6.3V 100	1	
C2034	ECQB1H273KZ	Mylar 50V 0.027	1	
		Crystal Oscillator		
X2001	VSX0131		1	
		Connectors		
P201,202	VJP1411	12P	2	
P203	VJP1244	4P	1	
	VEP02184A	Main [Servo (2), Drive, Jack & Picture VR] P.C. Board Unit		
		(Servo (2) Section)		
		Integrated Circuit		
IC2201	AN3715S		1	
		Transistor		
Q2201	2SC2603		1	(E2F)
		Diodes		
D2201	MA156		1	
D2203,2204	MA165		2	
D2206	MA165		1	
		Resistors		
R2201,2202	ERDS2TJ473	47K	2	
R2203	ERDS2TJ564	560K	1	
R2204	ERDS2TJ474	470K	1	
R2206	ERDS2TJ273	27K	1	
R2207	ERDS2TJ153	15K	1	
R2208	ERDS2TJ823	82K	1	
R2209	ERDS2TJ104	100K	1	
R2210	ERDS2TJ103	10K	1	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
R2211	ERDS2TJ333	33K	1	
R2212	ERDS2TJ124	120K	1	
R2213	ERDS2TJ563	56K	1	
R2214	ERDS2TJ332	3.3K	1	
R2215	ERDS2TJ564	560K	1	
R2216	ERDS2TJ271	270	1	
R2218	ERDS2TJ124	120K	1	
R2222	ERDS2TJ274	270K	1	
		Variable Resistors		
VR2210,2211	EVN3ACA00B15	100K	2	
		Capacitors		
C2201	ECQB1H562KH	Mylar 50V 5600P	1	
C2202	ECQB1H332KH	Mylar 50V 3300P	1	
C2203	ECQB1H682KH	Mylar 50V 6800P	1	
C2204	ECSF16ER47X	Tantalum 16V 0.47	1	
C2205	ECQB1H103KH	Mylar 50V 0.01	1	
C2206	VCYE1C103MR	Semiconductor 16V 0.01	1	
C2207	ECEA1HKS010	Electrolytic 50V 1	1	
C2208	VCYE1C333MR	Semiconductor 16V 0.033	1	
C2209	ECEA0GKS470	Electrolytic 6.3V 47	1	
C2210-2212	ECEA1EKK010	Electrolytic 25V 1	3	
C2213	VCYE1C333MR	Semiconductor 16V 0.033	1	
C2214,2215	VCYE1C103MR	Semiconductor 16V 0.01	2	
C2216	ECQV1H104JZ	Mylar 50V 0.1	1	
		(Drive Section)		
		Integrated Circuits		
IC2501	AN3830K		1	
IC2502	AN3810K		1	
IC2503	AN3620S		1	
IC2504	AN3830K		1	
IC2505	AN3821K		1	
		Transistors		
Q2501	2SC2603		1	(E2F)
Q2502	2SB641		1	(Q,R,S)
Q2503	2SA1115		1	(E,F)
		Combination Parts (Transistor & Resistor)		
QR2501	DTA114A		1	or UN1111
QR2503,2504	DTC144A		2	or UN1213
		Diodes		
D2501,2502	MA165		2	
D2503	MA154WA		1	
D2504	MA165		1	
D2506-2510	MA165		5	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
		Resistors		
R2501	ERDS2TJ120	12	1	
R2502	ERDS2TJ102	1K	1	
R2503	ERDS2TJR56	0.56	1	
R2505	ERDS2TJR56	0.56	1	
R2506	ERDS2TJ333	33K	1	
R2507	ERDS2TJ124	120K	1	
R2508	ERDS2TJ104	100K	1	
R2509	ERDS2TJ6R8	6.8	1	
R2510	ERDS2TJ332	3.3K	1	
R2511	ERDS2TJ101	100	1	
R2512	ERDS2TJ332	3.3K	1	
R2513	ERDS2TJ103	10K	1	
R2514	ERDS2TJ682	6.8K	1	
R2515	ERDS2TJ334	330K	1	
R2516	ERDS2TJ223	22K	1	
R2517	ERDS2TJ333	33K	1	
R2518	ERDS2TJ563	56K	1	
R2519	ERDS2TJ683	68K	1	
R2520	ERDS2TJ223	22K	1	
R2521	ERDS2TJ123	12K	1	
R2522	ERDS2TJ221	220	1	
R2524	ERDS2TJ561	560	1	
R2525	ERDS2TJR56	0.56	1	
R2526	ERDS2TJ120	12	1	
R2527,2528	ERDS2TJ224	220K	2	
R2529	ERDS2TJ104	100K	1	
R2530	ERDS2TJ223	22K	1	
R2531	ERDS2TJ103	10K	1	
R2532	ERDS2TJR68	0.68	1	
R2533	ERDS2TJ332	3.3K	1	
R2534	ERDS2TJ223	22K	1	
R2535	ERDS2TJ224	220K	1	
R2536	ERDS2TJ221	220	1	
R2537	ERDS2TJ820	82	1	
R2540	ERDS2TJ820	82	1	
R2542	ERDS2TJ153	15K	1	
R2543	ERDS2TJ563	56K	1	
R2544,2545	ERDS2TJ6R8	6.8	2	
R2546	ERDS2TJ563	56K	1	
		Capacitors		
C2501,2502	ECEA1EKK010	Electrolytic 25V 1	2	
C2503-2505	ECEA1EKK4R7	Electrolytic 25V 4.7	3	
C2506	ECEA1CKS470	Electrolytic 16V 47	1	
C2507,2508	VCYE1C103MR	Semiconductor 16V 0.01	2	
C2509-2511	ECEA1VSN2R2	Electrolytic 35V 2.2	3	
C2512	ECEA1EKK3R3	Electrolytic 25V 3.3	1	
C2513	ECQB1H682KH	Mylar 50V 6800P	1	
C2514	ECQB1H123KZ	Mylar 50V 0.012	1	
C2515	ECEA1EKKR22	Electrolytic 25V 0.22	1	
C2516	ECEA0GKS470	Electrolytic 4V 47	1	
C2517	ECEA1EKK010	Electrolytic 25V 1	1	
C2518	ECKF1H101KB	Ceramic 50V 100P	1	
C2520	ECQV1H473JZ	Mylar 50V 0.047	1	
C2521	ECEA0JKS470	Electrolytic 6.3V 47	1	
C2522	ECEA1EKKR22	Electrolytic 25V 0.22	1	
C2523	ECEA1EKK4R7	Electrolytic 25V 4.7	1	
C2524	ECEA1EKKR22	Electrolytic 25V 0.22	1	
C2525	ECEA1EKK4R7	Electrolytic 25V 4.7	1	
C2526,2527	ECEA1EKK010	Electrolytic 25V 1	2	
C2528-2530	ECEA1EKK4R7	Electrolytic 25V 4.7	3	
C2531	VCYE1C104MR	Semiconductor 16V 0.1	1	
C2532	ECEA1EKK010	Electrolytic 25V 1	1	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
C2533-2535	ECEA1VSN2R2	Electrolytic 35V 2.2	3	
C2536	ECEA1AKS470	Electrolytic 10V 47	1	
C2537	ECEA1CKK100	Electrolytic 16V 10	1	
C2538-2543	VCYE1C473MR	Semiconductor 16V 0.047	6	
C2545	ECEA1CKS470	Electrolytic 16V 47	1	
C2546	VCYE1C103MR	Semiconductor 16V 0.01	1	
C2547	ECKF1H472ZF	Ceramic 50V 4700P	1	
		Coil		
L2501	VLQEL05F221K	220μH	1	
		Switch		
SW2501	ESD14126		1	
		Combination Parts (Capacitor & Resistor)		
CR2501	EXED103Z183C	0.01 18K	1	
		(Picture VR Section)		
		Resistor		
R3501	ERDS2TJ682	6.8K	1	
		Variable Resistor		
VR3504	EVN3ACA00B24	20K	1	
		(Jack Section)		
		Integrated Circuit		
IC6501	VCR0095		1	
IC6502	VCR0092		1	
		Diodes		
D6501	ERC81004		1	
D6502,6503	MA165		2	
		Resistors		
R6501	ERDS2TJ750	75	1	
R6503	ERDS2TJ681	680	1	
R6504	ERDS2TJ750	75	1	
R6505	ERDS2TJ681	680	1	
R6506	ERDS2TJ472	4.7K	1	
R6507	ERDS2TJ104	100K	1	
R6508	ERDS2TJ331	330	1	
R6509	ERDS2TJ472	4.7K	1	
R6510	ERDS2TJ750	75	1	
R6511	ERDS2TJ392	3.9K	1	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
		Capacitors		
C6501	ECEA1EKK4R7	Electrolytic 25V 4.7	1	
C6502	ECEA0JKS470	Electrolytic 6.3V 47	1	
C6503	ECEA1CKS220	Electrolytic 16V 22	1	
C6504	ECEA1CKS100	Electrolytic 16V 10	1	
C6508	ECEA1EKK3R3	Electrolytic 25V 3.3	1	
C6509	ECQV1H153JZ	Mylar 50V 0.015	1	
C6510	ECEA1AKS330	Electrolytic 10V 33	1	
C6511	ECQV1H103JZ	Mylar 50V 0.01	1	
C6512	ECEA1AKS330	Electrolytic 10V 33	1	
		Coils		
L6501	VLQEL05F101	100μH	1	
L6503	EIR7QF004B	0.004μH	1	
		Combination Parts (Capacitor & Resistor)		
CR6501	EXED391K472C	390P 4.7K	1	
		Relay		
RY6501	VSY2036		1	
		Connectors		
P205,206	VJP1243	3P	2	
P207-211	VJP1229	2P	5	
P212	VJP1231	4P	1	
P213	VJP1252	12P	1	
P214	VJP1243	3P	1	
P215	VJP1242	2P	1	
P216	VJP1232	5P	1	
P217	VJP1237	10P	1	
P218	VJP1229	2P	1	
P219	VJP1231	4P	1	
P220	VJP1242	2P	1	
		Miscellaneous		
	VHN0011	Rivet	2	
	VEP03200A/B	Luminance, Chrominance Audio P.C. Board Unit		
		(Luminance Section)		

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
		Integrated Circuit		
IC3003	AN3310K		1	
IC3002	VCR0090		1	
IC3004	VCR0096		1	
		P.C.B. Ass'y		
IC3001	VEFY007		1	
		Transistors		
Q3001,3002	2SC2206		2	(B,C)
Q3003	2SD636		1	(Q,R,S)
		Combination Circuit (Transistor & Resistor)		
QR3002	UN1217		1	
		Diodes		
D3001-3003	MA165		3	
		Resistors		
R3001	ERDS2TJ332	3.3K	1	
R3002	ERDS2TJ122	1.2K	1	
R3003	ERDS2TJ472	4.7K	1	
R3004	ERDS2TJ474	470K	1	
R3005	ERDS2TJ394	390K	1	
R3006	ERDS2TJ561	560	1	
R3007	ERDS2TJ334	330K	1	
R3008	ERDS2TJ823	82K	1	
R3009	ERDS2TJ104	100K	1	
R3011	ERDS2TJ102	1K	1	
R3012	ERDS2TJ152	1.5K	1	
R3013	ERDS2TJ102	1K	1	
R3014	ERDS2TJ393	39K	1	
R3015	ERDS2TJ471	470	1	
R3016	ERDS2TJ823	82K	1	
R3017	ERDS2TJ331	330	1	
R3018	ERDS2TJ223	22K	1	
R3024	ERDS2TJ152	1.5K	1	
R3025	ERDS2TJ102	1K	1	
R3026	ERDS2TJ681	680	1	
R3027	ERDS2TJ121	120	1	
R3028	ERDS2TJ102	1K	1	
R3030	ERDS2TJ472	4.7K	1	
R3031	ERDS2TJ271	270	1	
R3032	ERDS2TJ153	15K	1	
		Variable Resistors		
VR3001	EVML3GA00B13	1K	1	
VR3005-3008	EVML3GA00B13	1K	4	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
		Capacitors		
C3001	ECEA0JK221	Electrolytic 6.3V 220	1	
C3002	VCYE1C473MR	Semiconductor 16V 0.047	1	
C3003	ECKF1H221KB	Ceramic 50V 220P	1	
C3004	ECEA0JK221	Electrolytic 6.3V 220	1	
C3005	VCYE1C473MR	Semiconductor 16V 0.047	1	
C3006	ECEA1EKK3R3	Electrolytic 25V 3.3	1	
C3007	ECEA1EKK4R7	Electrolytic 25V 4.7	1	
C3008	ECEA1EKK2R2	Electrolytic 25V 2.2	1	
C3009	ECEA1EKK3R3	Electrolytic 25V 3.3	1	
C3010	ECEA0JKS220	Electrolytic 6.3V 22	1	
C3011	ECCF1H680K	Ceramic 50V 68P	1	
C3012	ECCF1H220K	Ceramic 50V 22P	1	
C3013	ECKF1H271J	Ceramic 50V 270P	1	
C3014	ECEA1EKK3R3	Electrolytic 25V 3.3	1	
C3015	ECEA0JKS220	Electrolytic 6.3V 22	1	
C3016,3017	ECEA0JK221	Electrolytic 6.3V 220	2	
C3018,3019	ECEA1AJS330	Electrolytic 10V 33	2	
C3020	ECEA1AKS220	Electrolytic 10V 22	1	
C3021	ECKF1H102KB	Ceramic 50V 1000P	1	
C3023	ECCF1H680K	Ceramic 50V 68P	1	
C3024	ECSF1CD105	Tantalum 16V 1	1	
C3025	ECEA1AKS330	Electrolytic 10V 33	1	
C3026	ECKF1H181KB	Ceramic 50V 180P	1	
C3027	ECEA1CKK100	Electrolytic 16V 10	1	
C3028	ECKF1H121KB	Ceramic 50V 120P	1	
C3030	ECEA1CKK100	Electrolytic 16V 10	1	
C3031,3032	ECV1ZW90X64	Trimmer 500V 90P	2	
C3033,3034	ECEA1CKK100	Electrolytic 16V 10	2	
C3035,3036	ECV1ZW90X64	Trimmer 500V 90P	2	
C3037	ECEA1CKK100	Electrolytic 16V 10	1	
C3038-3043	VCYE1C103MR	Semiconductor 16V 0.01	6	
C3044	ECEA0JKS470	Electrolytic 6.3V 47	1	
C3045	VCYE1C473MR	Semiconductor 16V 0.047	1	
C3046	ECKF1H151KB	Ceramic 50V 150P	1	
C3047	ECCF1H820J	Ceramic 50V 82P	1	
C3048	VCKF1H431J	Semiconductor 50V 430P	1	
C3049	ECSF1CD105	Tantalum 16V 1	1	
C3050	ECCF1H220K	Ceramic 50V 22P	1	
C3051	ECKF1H102KB	Ceramic 50V 1000P	1	
C3053	ECEA1CKK100	Electrolytic 16V 10	1	
C3054	ECCF1H050K	Ceramic 50V 5P	1	
		Coils		
L3001	VLQEL05F101K	100μH	1	
L3002	VLQEL05F471K	470μH	1	
L3003	VLQEL05F101K	100μH	1	
L3004	VLQEL05F471K	470μH	1	
L3005	VLQEL05F101K	100μH	1	
L3006	VLQEL05F820K	82μH	1	
L3007	VLQEL05F471K	470μH	1	
L3008	VLQEL05F270K	27μH	1	
L3009	VLQEL05F151K	150μH	1	
L3010	VLQEL05F180K	18μH	1	
L3011	VLQEL05F150K	15μH	1	
L3012	VLQEL05F151K	150μH	1	
L3013	VLQEL05F220K	22μH	1	
L3014,3015	VLQEL05F150K	15μH	2	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
		Combination Parts		
		(Capacitor & Resistor)		
CR3001	EXED473M683C	0.047 68K	1	
		Filters		
FL3001	VLF0311		1	
FL3002	VLD0065		1	
FL3003	VLF0312		1	
FL3005	VLF0316		1	
FL3006	VLF0312		1	
		(Audio Section)		
		P.C.B. Ass'y		
IC4001	VEFA005		1	
		Transistor		
Q4001	2SD636		1	(Q,R)
		Resistors		
R4001	ERDS2TJ100	10	1	
R4002	ERDS2TJ153	15K	1	
R4003	ERDS2TJ332	3.3K	1	
R4004	ERDS2TJ470	47	1	
R4005	ERDS1TJ335S	3.3M	1	
R4007	ERDS2TJ563	56K	1	
R4009	ERDS2TJ103	10K	1	
R4010	ERDS2TJ104	100K	1	
		Variable Resistor		
VR4001	EVML3GA00B23	2K	1	
		Capacitors		
C4001	ECQP1102JZ	Mylar 100V 1000P	1	
C4002	ECCD2H270K	Ceramic 500V 27P	1	
C4003	ECEA1CKK100	Electrolytic 16V 10	1	
C4004	ECEA0JKS220	Electrolytic 6.3V 22	1	
C4005	ECEA1EKK010	Electrolytic 25V 1	1	
C4006	ECEA1CKS470	Electrolytic 16V 47	1	
C4008	ECEA0JKS470	Electrolytic 6.3V 47	1	
C4009	ECEA0JKS220	Electrolytic 6.3V 22	1	
C4010-4012	ECEA0JKS470	Electrolytic 6.3V 47	3	
C4013	ECEA1CKK100	Electrolytic 6.3V 10	1	
C4014	VCYE1E472MR	Semiconductor 25V 4700P	1	
C4015	ECQV1H333JZ	Mylar 50V 0.033	1	
C4016	ECEA1CKK100	Electrolytic 16V 10	1	
C4017	ECV1ZW60X64	Trimmer 500V 60P	1	
		Coils		
L4001	VLQEL05F101K	100μH	1	
L4002	VLQEL07F562J	5.6mH	1	
L4004	VLQEL05F101K	100μH	1	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
		Combination Parts		
		(Capcitor & Resistor)		
CR4001	EXED153M473C	0.015 47K	1	
CR4002	EXED122K473C	1200P 47K	1	
CR4003	EXED391K563	390P 56K	1	
		Transformer		
T4001	EIQ7QF005B		1	
		(Chrominance Section)		
		P.C.B. Ass'y		
IC8001	VEFC009		1	
		Transistors		
Q8001	2SC2206		1	(B,C) NV-180EG
Q8002	2SC2206		1	(B,C)
Q8003	2SC2206		1	(B,C) NV-180EG
Q8004	2SB641		1	(Q,R,S)
Q8005	2SD636		1	(Q,R,S)
Q8006	2SC2206		1	(B,C)
Q8007	2SD636		1	(Q,R,S)
		Combination Parts		
		(Transistor & Resistor)		
QR8001	DTC144A		1	or UN1213 NV-180EG
QR8002,8003	UN1217		2	
QR8004,8005	DTC124A		1	or UN1212 NV-180EG
		Diodes		
D8001,8002	MA165		2	
		Resistors		
R8001	ERDS2TJ103	10K	1	NV-180EG
R8002	ERDS2TJ393	39K	1	NV-180EG
R8003	ERDS2TJ333	33K	1	
R8004	ERDS2TJ332	3.3K	1	
R8005	ERDS2TJ393	39K	1	
R8006	ERDS2TJ681	680	1	
R8007	ERDS2TJ271	270	1	
R8008	ERDS2TJ821	820	1	
R8009	ERDS2TJ221	220	1	
R8010	ERDS2TJ473	47K	1	NV-180EG
R8011	ERDS2TJ104	100K	1	NV-180EG
R8012	ERDS2TJ102	1K	1	NV-180EG
R8013	ERDS2TJ562	5.6K	1	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
R8014	ERDS2TJ470	47	1	
R8015	ERDS2TJ122	1.2K	1	
R8017	ERDS2TJ102	1K	1	
R8018,8019	ERDS2TJ562	5.6K	2	
R8020	ERDS2TJ822	8.2K	1	
R8021	ERDS2TJ820	82	1	NV-180EG
R8022	ERDS2TJ151	150	1	
R8023	ERDS2TJ103	10K	1	
R8024	ERDS2TJ102	1K	1	
R8025	ERDS2TJ333	33K	1	
R8026	ERDS2TJ102	1K	1	
R8027	ERDS2TJ681	680	1	NV-180EG
R8028	ERDS2TJ123	12K	1	
R8029	ERDS2TJ105	1M	1	
R8030	ERDS2TJ182	1.8K	1	
R8031	ERDS2TJ123	12K	1	
R8032	ERDS2TJ103	10K	1	
R8033	ERDS2TJ333	33K	1	
R8034	ERDS2TJ273	27K	1	
R8035	ERDS2TJ821	820	1	
R8036	ERDS2TJ104	100K	1	
R8037	ERDS2TJ102	1K	1	
R8038	ERDS2TJ473	47K	1	
R8039,8040	ERDS2TJ102	1K	2	
R8041	ERDS2TJ561	560	1	
		Capacitors		
C8001,8002	VCYE1C103MR	Semiconductor 16V 0.01	2	
C8003,8004	VCYE1C103MR	Semiconductor 16V 0.01	2	NV-180EG
C8005	ECEA1CKK100	Electrolytic 16V 10	1	
C8006	ECQV1H223JZ	Mylar 50V 0.022	1	
C8007	VCYE1C103MR	Semiconductor 16V 0.01	1	
C8008,8009	ECEA0JKS470	Electrolytic 6.3V 47	2	
C8010	ECKF1H102KB	Ceramic 50V 1000P	1	
C8011	ECCF1H030CC	Ceramic 50V 3P	1	
C8012	ECEA0JK221	Electrolytic 6.3V 220	1	
C8013	VCYE1C473MR	Semiconductor 16V 0.047	1	
C8015	ECEA0JKS470	Electrolytic 6.3V 47	1	
C8016	ECEA1CKK100	Electrolytic 16V 10	1	
C8017	VCYE1C473MR	Semiconductor 16V 0.047	1	
C8018	ECQB1H182KH	Mylar 50V 1800P	1	
C8019	ECQB1H103KH	Mylar 50V 0.01	1	
C8020	VCYE1C103MR	Semiconductor 16V 0.01	1	
C8021	ECSF1VZ154	Tantalum 35V 0.15	1	
C8022	ECSF1VZ104	Tantalum 35V 0.1	1	NV-180EG
C8023	VCYE1C103MR	Semiconductor 16V 0.01	1	
		Coils		
L8001	VLQEL05F101K	100μH	1	
L8002	VLQEL05F470K	47μH	1	
L8003	VLQEL05F101K	100μH	1	
L8004	VLQEL05F150K	15μH	1	
L8005,8006	VLQEL05F681K	680μH	2	
		Filters		
FL8001	VLF0315		1	
FL8002	VLF0313		1	
FL8003	VLF0314		1	
FL8004	VLD0064		1	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
		Crystal Oscillator		
X8001	VSX0132		1	
		Connectors		
P32	VJP1235	8P	1	
P33	VJP1409	16P	1	
P34	VJP1410	20P	1	
P41	VJP1231	4P	1	
		Miscellaneous		
	VSC1195	Audio Shield Board	1	
	VSC1183	Head Amp Shield Case (A)	1	
	VSC1185	Head Amp Shield Case (C)	1	
	VMZ0581	Head Amp Shield Case	1	
		Barrier		
	VEP03201A	SECAM P.C. Board Unit		NV-180EG
		Integrated Circuit		
IC8501	BA7025L		1	
		Resistors		
R8501	ERDS2TJ103	10K	1	
R8502	ERDS2TJ102	1K	1	
R8503	ERDS2TJ223	22K	1	
R8504	ERDS2TJ390	39	1	
R8505	ERDS2TJ222	2.2K	1	
R8506	ERDS2TJ154	150K	1	
R8507	ERDS2TJ472	4.7K	1	
		Capacitors		
C8501	ECKF1H102KB	Ceramic 50V 1000P	1	
C8502	ECQV1H563JZ	Mylar 50V 0.056	1	
C8503,8504	ECEA0JKS470	Electrolytic 6.3V 47	2	
C8505	ECKF1H102KB	Ceramic 50V 1000P	1	
C8506	ECEA1AKS330	Electrolytic 10V 33	1	
		Coil		
L8501	VLQEL05F101K	100μH	1	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
		Filter		
FL8501	VLF0143		1	
		Connector		
P8501	VJP1235	8P	1	
	VEP06218A	System Control P.C. Board Unit		
		Integrated Circuits		
IC6001	MN1534VGA		1	
IC6002	μPD7503G		1	
IC6003	MN6283		1	
IC6004	BA6209U3		1	
IC6005	VCR0091		1	
IC6006	VCR0093		1	
		Transistors		
Q6001	2SD636		1	(Q,R,S)
Q6002	2SB819		1	(Q,R,S,A,U)
Q6003	2SD973		1	(Q,R,S)
Q6004	2SD636		1	(Q,R,S)
Q6005	2SB641		1	(Q,R,S)
Q6006-6008	2SD636		3	(Q,R,S)
Q6009	2SD992		1	(K,L,M)
Q6010	2SC2594		1	
Q6011	2SB774		1	
		Combination Parts		
		(Transistor & Resistor)		
QR6001,6002	DTA124A		2	
QR6003	DTC124A		1	
QR6004	DTA124A		1	or UN1112
QR6005	DTC114A		1	or UN1211
QR6006	DTC144A		1	or UN1213
QR6007	DTC124A		1	or UN1212
		Diodes		
D6001	MA165		1	
D6002-6005	MA154WA		4	
D6006,6007	MA165		2	
D6008	MA4047		1	
D6009	10E1		1	
D6010-6013	MA165		4	

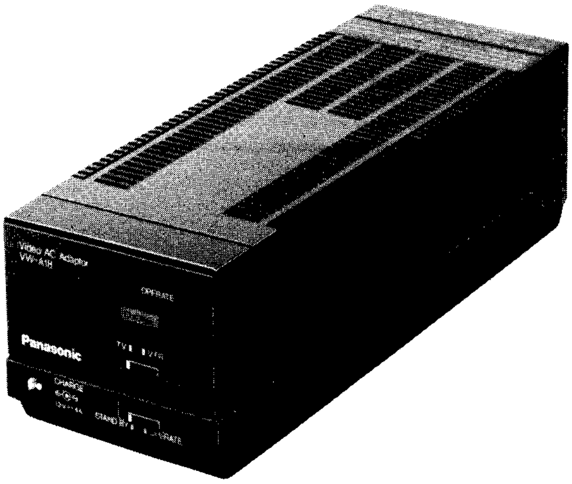
Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
D6014	10E1		1	
D6015	MA165		1	
D6016	10E1		1	
D6017,6018	MA165		2	
D6019,6020	MA154WA		2	
D6021	MA165		1	
D6023	MA165		1	
		Resistors		
R6001,6002	ERDS2TJ473	47K	2	
R6003	ERDS2TJ270	27	1	
R6004,6005	ERDS2TJ104	100K	2	
R6006	ERDS2TJ472	4.7K	1	
R6007	ERDS2TJ103	10K	1	
R6008	ERDS2TJ562	5.6K	1	
R6009	ERG1ANJ820	Metal Oxide 1W 82	1	
R6010	ERDS2TJ104	100K	1	
R6011	ERDS2TJ184	180K	1	
R6012	ERDS2TJ124	120K	1	
R6013	ERDS2TJ221	220	1	
R6014	ERDS2TJ102	1K	1	
R6015	ERDS2TJ103	10K	1	
R6016	ERDS2TJ683	68K	1	
R6017	ERDS2TJ104	100K	1	
R6018	ERDS2TJ472	4.7K	1	
R6019	ERDS2TJ224	220K	1	
R6020	ERDS2TJ474	470K	1	
R6021	ERDS2TJ222	2.2K	1	
R6022	ERDS2TJ103	10K	1	
R6023	ERDS2TJ823	8.2K	1	
R6024	ERDS2TJ681	680	1	
R6025	ERDS2TJ563	56K	1	
R6027	ERDS2TJ273	27K	1	
R6028	ERDS2TJ104	100K	1	
R6029,6030	ERDS2TJ153	15K	2	
R6031	ERDS2TJ221	220	1	
R6032	ERDS2TJ332	3.3K	1	
R6033,6034	ERDS2TJ271	270	1	
R6035	ERDS2TJ103	10K	1	
R6036	ERDS2TJ223	22K	1	
R6037	ERDS2TJ103	10K	1	
R6038,6039	ERDS2TJ563	56K	2	
R6040,6041	ERDS2TJ104	100K	2	
R6042	ERDS2TJ562	5.6K	1	
R6043,6044	ERDS2TJ103	10K	2	
R6045,6046	ERDS2TJ104	100K	2	
R6048	ERDS2TJ223	22K	1	
R6049	ERDS2TJ271	270	1	
R6050	ERDS2TJ184	180K	1	
R6051	ERDS2TJ474	470K	1	
R6052	ERDS2TJ223	22K	1	
R6053-6055	ERDS2TJ104	100K	3	
R6056	ERDS2TJ184	180K	1	
R6057,6058	ERDS2TJ103	10K	2	
R6059	ERDS2TJ222	2.2K	1	
R6060	ERDS2TJ473	47K	1	
R6061	ERDS2TJ104	100K	1	
R6063,6064	ERDS2TJ101	100	2	
R6065	ERDS2TJ223	22K	1	
R6066	ERDS2TJ472	4.7K	1	
R6067	ERDS2TJ473	47K	1	
R6068	ERDS2TJ102	1K	1	
R6069	ERDS2TJ223	22K	1	
R6070	ERDS2TJ123	12K	1	
R6071-6073	ERDS2TJ223	22K	3	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
		Variable Resistor		
VR6001	EVML3GA00B14	1K	1	
		Capacitors		
C6001	ECEA0JKS101	Electrolytic 6.3V 100	1	
C6002	ECKF1H103ZF	Ceramic 50V 0.01	1	
C6003	ECCF1H330KC	Ceramic 50V 33P	1	
C6004	ECFC1H100DC	Ceramic 50V 10P	1	
C6005	ECEA1H010	Electrolytic 50V 1	1	
C6006,6007	ECKF1H103ZF	Ceramic 50V 0.01	2	
C6008	ECEA1VSN2R2	Electrolytic 35V 2.2	1	
C6009-6012	ECEA1HKS010	Electrolytic 50V 1	4	
C6013-6015	ECKF1H103ZF	Ceramic 50V 0.01	3	
C6016	ECEA1CU471	Electrolytic 16V 470	1	
C6017	ECEA0GKS470	Electrolytic 4V 47	1	
C6018,6019	ECKF1H103ZF	Ceramic 50V 0.01	2	
C6020	ECEA1EKS4R7	Electrolytic 25V 4.7	1	
C6021	ECEA0JKS220	Electrolytic 6.3V 22	1	
C6022	VCYE1C103MR	Semiconductor 16V 0.01	1	
C6023	ECQB1H183KH	Mylar 50V 0.018	1	
C6024-6026	VCYE1C103MR	Semiconductor 16V 0.01	3	
C6027	ECEA1HKS010	Electrolytic 50V 1	1	
		Crystal Oscillator		
X6001	VSX0086		1	
		Switches		
SW601	EMR2521		1	⚠
SW602	VSS0101		1	
SW604	VSS0101		1	
		Connectors		
P601	VJP1244	4P	1	
P602	VJP1242	2P	1	
		Miscellaneous		
PR1	VSF0015A08	IC Protector	1	⚠
	VHN0040	Rivet	2	
	VJF0190	Fuse Holder	2	⚠
	EDD073K22A3	LED	1	
	LN0408CP3	Back Light	1	
	VMD0601	Display Case	1	
	VMD0602	Display Case (Bottom)	1	
	VSQ0344	Zebra Rubber	1	
	XTNV14+5Z	Screw	6	
	XTNV14+8Z	Screw	1	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
	ENC17751/ ENC17752	RF Converter Unit		
		Integrated Circuit		
IC1	AN3130		1	
		Transistor		
Q1	2SC2480		1	
		Diodes		
D1,2	1SS86		2	or 1SS174
		Resistors		
R1	ERJ6GCSJ391	Chip 390	1	
R2	ERJ6GCSJ681	Chip 680	1	
R3	EVN3ACA00B14	Variable 10K	1	
R4	ERJ6GCSJ823	Chip 82K	1	
R5	ERDS2TJ562	5.6K	1	
R6	ERJ6GCSJ331	Chip 330	1	
R7	ERJ6GCSJ122	Chip 1.2K	1	
R8	ERJ6GCSJ221	Chip 220	1	
R9	ERJ6GCSJ560	Chip 56	1	
R10	ERJ6GCSJ680	Chip 68	1	
		Connector		
P1	VJB1143	5P	1	
	NOTE: The Capacitors, Filters, Transformers for the RF Converter Unit are not available as spare parts.			
	VJB00B67	FE Head P.C. Board	1	
		Transistor		
Q1503	2SC2603A		1	
		Resistor		
R1501	ERDS2TJ333	33K	1	
		Capacitors		
C1501	ECKF1H472ZF	Ceramic 50V 4700P	1	
C1502	ECEA1CKS100	Electrolytic 16V 10	1	
C1503	ECQV1H333JZ	Mylar 50V 0.033	1	
C1504	VCYF1C103MR	Semiconductor 16V 0.01	1	
		Coil		
L1501	VLQEL05F221K	220μH	1	
		Transformer		
T1501	VTD0014		1	
		Connector		
P654	VJP1229	2P	1	
	VJB00B68	Tracking P.C. Board		
		Resistors		
R6561,6562	EVLB6AA00B15	Variable 100K	2	
	VJB00B87	Tension Sensor P.C. Board		
Q1504	ON1301	Photo Caprier	1	(Q) ...... R1502 is ERDS2TJ102 or (R) ... R1502 is ERDS2TJ182
		Resistor		
R1502	ERDS2TJ102	1K	1	In case Q1504 is ON1301 (Q)
R1502	ERDS2TJ182	1.8K	1	In case Q1504 is ON1301 (R)

AC Adaptor

VW-A18EB


Video AC Adaptor
VW-A18
OPERATE
Panasonic
TV
VTR
CHARGE
STAND BY
OPERATE

SPECIFICATIONS

Power Source:	220/240 V AC 50/60 Hz
Power Consumption:	40 W
Output:	12 V DC, 1.2 A
	12 V DC, 1.4 A for battery charge
	20 V DC, 0.15 A for HEATER (VTR MODE)
Weight:	2.6 kg
Dimensions:	87(W) × 69(H) × 238(D) mm

Weight and dimensions shown are approximate.
Specifications are subject to change without notice.

CAUTION: FOR USE WITH VIDEO TAPE RECORDER, MODEL NV-180.
WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.

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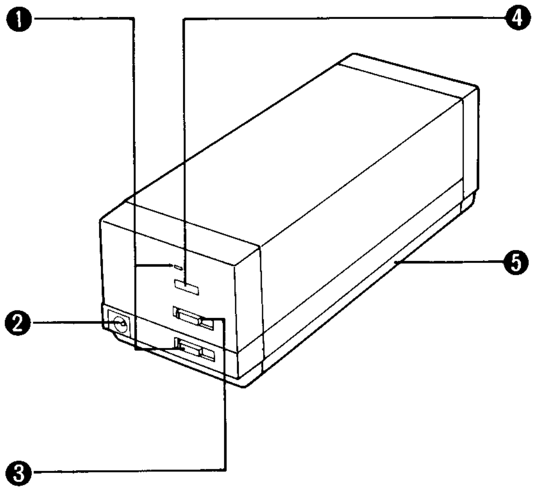
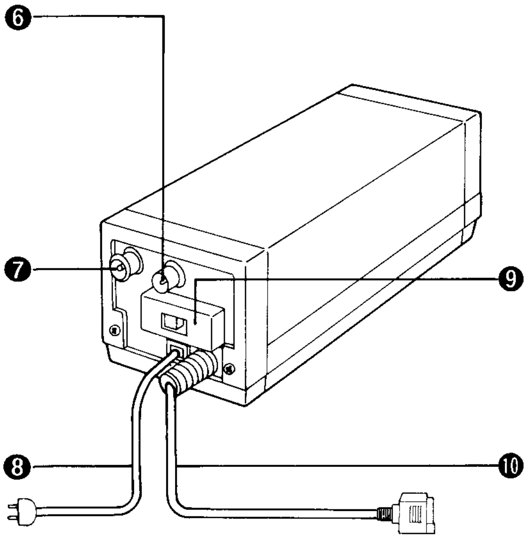
1. CONTROLS AND COMPONENTS





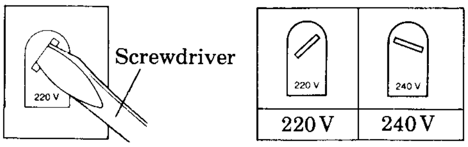
❶ **Operation Switch with indicator lamp**
Set to "OPERATE" to turn the unit on.

❷ **Battery Pack Charging Socket**
Used for charging the battery pack.

❸ **TV/VTR Selector Switch**
VTR: Used to play back a video cassette.
TV: Used to watch TV.

❹ **Charging Indicator Lamp**
Lights up when the battery pack is charged. When charging is completed, this lamp goes off.

❺ **Voltage Selector**
Ensure that the selector is set at the same indication as the local mains voltage before plugging.


Screwdriver
220 V
220 V
240 V
220V
240V

Voltage Selector

Note:
Power Switch must be off and Power Cord disconnected from mains prior to changing the voltage selector.

❻ **RF Output Socket**
Connect it to TV.

❼ **RF Input Socket**
Connect it to an antenna.

❽ **Mains Cord**
For connection to an ordinary mains.

❾ **POWER ON/OFF Switch**
Switching on applies power to the unit. To switch off this unit completely, set to "OFF".

❿ **Adaptor Cable**
Connect to the VTR's adaptor socket.

2. DISASSEMBLY METHOD

1. **Removal of the Top Case**
   Unscrew the 2 screws (A) and remove the Top Case.

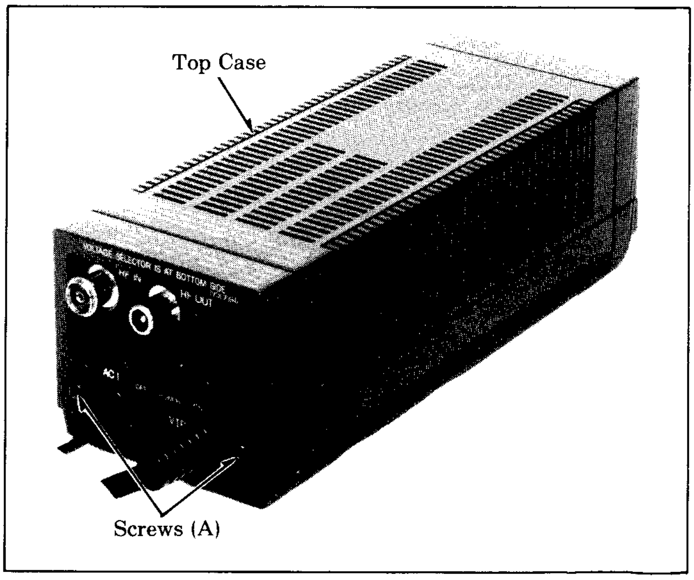

Top Case
VOLTAGE SELECTOR IS AT BOTTOM SIDE
RF IN
RF OUT
Screws (A)

Fig. 1 Removal of the Top Case

2. Removal of the Front Panel

Unscrew the 2 screws (B) and remove the Front Panel.

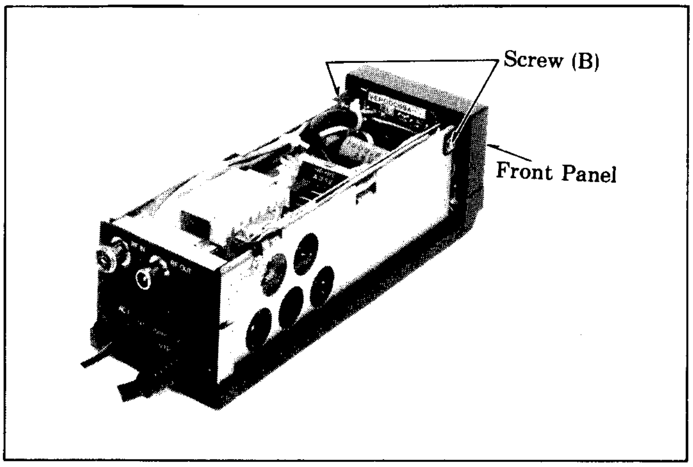

Screw (B)
Front Panel

Fig. 2 Removal of the Front Panel

3. Removal of the Bottom Case

Unscrew the 4 screws (C) and remove the Bottom Case.

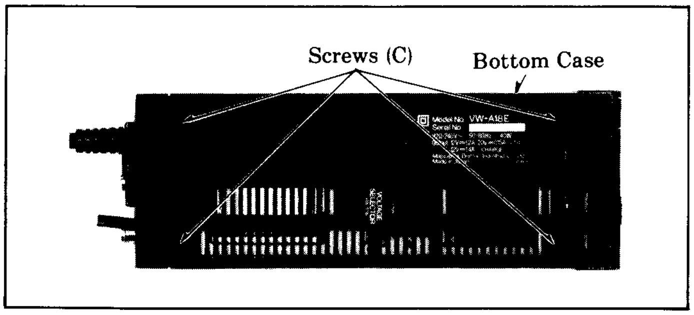

Screws (C)
Bottom Case

Fig. 3 Removal of the Bottom Case

4. Removal of the Main C. Board

Unscrew 3 screws (D) and remove the cord clamper (E), then lift the Main P.C. Board.

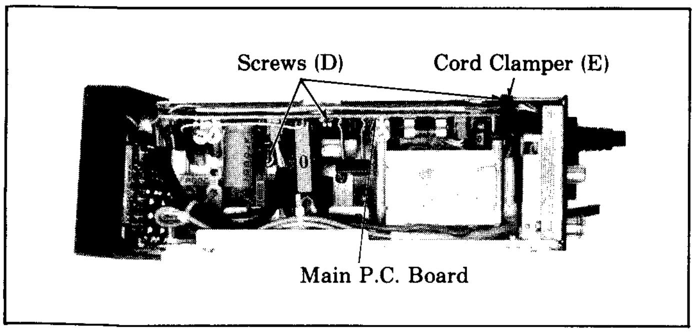

Screws (D)
Cord Clamper (E)
Main P.C. Board

Fig. 4 Removal of the Main C. Board

5. Removal of the Primary C. Board

Unscrew the screw (F) and lift the Primary C. Board.

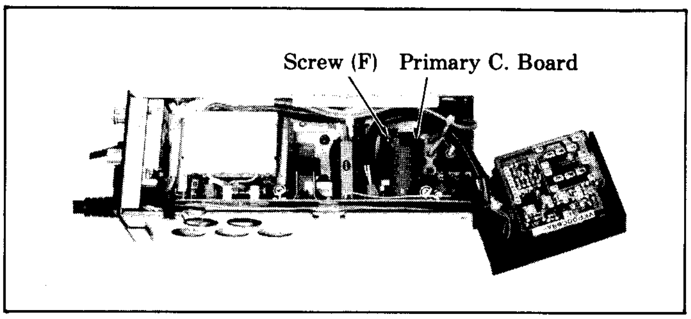

Screw (F)
Primary C. Board

Fig. 5 Removal of the Primary C. Board

6. Removal of the Front C. Board

Unscrew the 2 screws (G) and Unlock the 2 locking tabs (H) to remove the Front C. Board.

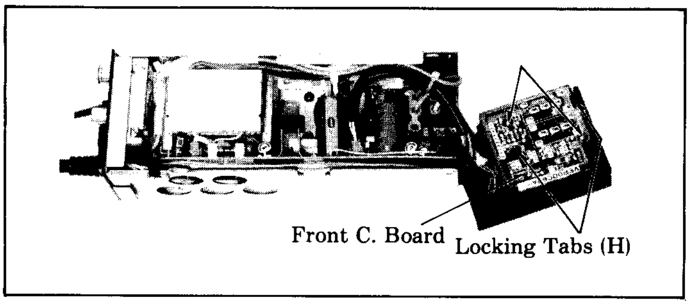

Front C. Board
Locking Tabs (H)

Fig. 6 Removal of the Front C. Board

7. Removal of the LED C. Board

Unlock the 2 locking tabs (I) to remove the LED C. Board.

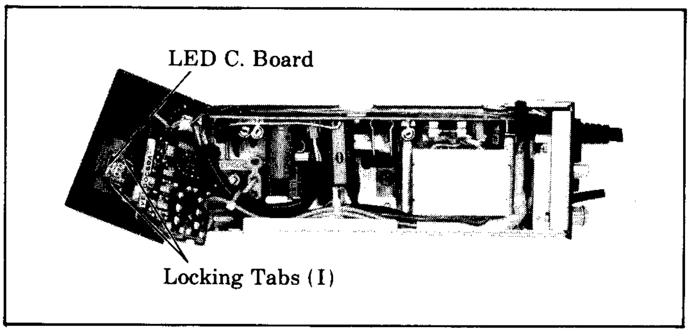

LED C. Board
Locking Tabs (I)

Fig. 7 Removal of the LED C. Board

3. ELECTRICAL ADJUSTMENT PROCEDURES

This section provides complete electrical adjustment procedures which may be required for electronic circuit of the AC Adaptor VW-A18.

3-1. TEST EQUIPMENTS

To perform the electrical adjustments completely, following equipments are required.

1. D.V.M. (Digital Volt Meter)
   Voltage Range: 0.001 ~ 50 V
2. Oscilloscope
   Voltage Range: 0.005 ~ 50 V/div.
3. DC A.M. (DC Ammeter)
   Current Range: 0 ~ 10 A
4. DC V.M. (DC Voltmeter)
   Voltage Range: 0 ~ 20 V
5. Plastic Tip Driver
6. Resistor (11Ω/120 W)
7. DC Power Supply (5 A/20 V)
8. Resistor (5Ω variable/200 W)

3-2. POWER SUPPLY OUTPUT VOLTAGE ADJUSTMENT

TP	ADJ.	MODE	INPUT
MULTI CONNECTOR -(1) (+) -(11) (−)	VR01	POWER SUPPLY	
TAPE	**M. EQ.**	**SPEC.**	
	D.V.M	13.85 ± 0.5 V	

1. Connect a jumper wire between pin (1) and pin (17) of the Multi Connector for make the unit in power supply mode.
2. Connect the resistor (11Ω/120 W) between pin (1) and pin (11) of the Multi Connector.

3-3. INCIPIENT CHARGE CURRENT AND SCHMITT VOLTAGE ADJUSTMENT

TP	ADJ.	MODE	INPUT
MULTI CONNECTOR -(1) (+) -(11) (−)	VR02 VR03	CHARGE	
TAPE	**M. EQ.**	**SPEC.**	
	DC AM D.V.M.	I = 1.40 − 0.002 (25 − t) ± 0.02 A (VR02) V = − 0.03 t + 16.05 ± 0.1 V (VR03) t: Ambient temperature [0 °C]	

1. Make the connection as shown below.

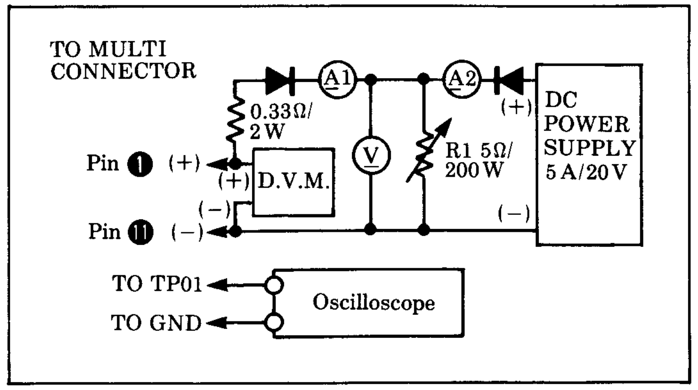
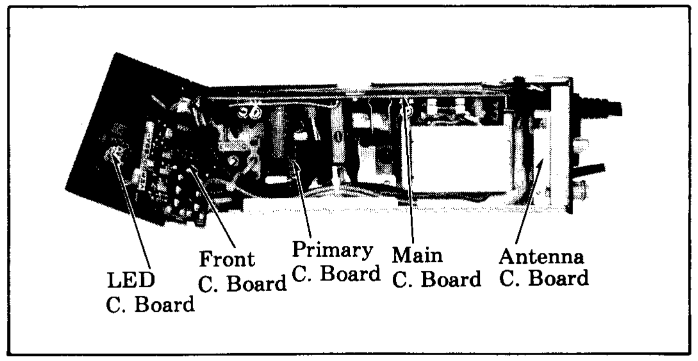

TO MULTI CONNECTOR
A1
A2
0.33Ω/
2W
Pin ❶ (+)
(+) D.V.M.
(−)
Pin ⓫ (−)
V
R1 5Ω/
200 W
(+)
(−)
DC
POWER
SUPPLY
5 A/20 V
TO TP01
TO GND
Oscilloscope

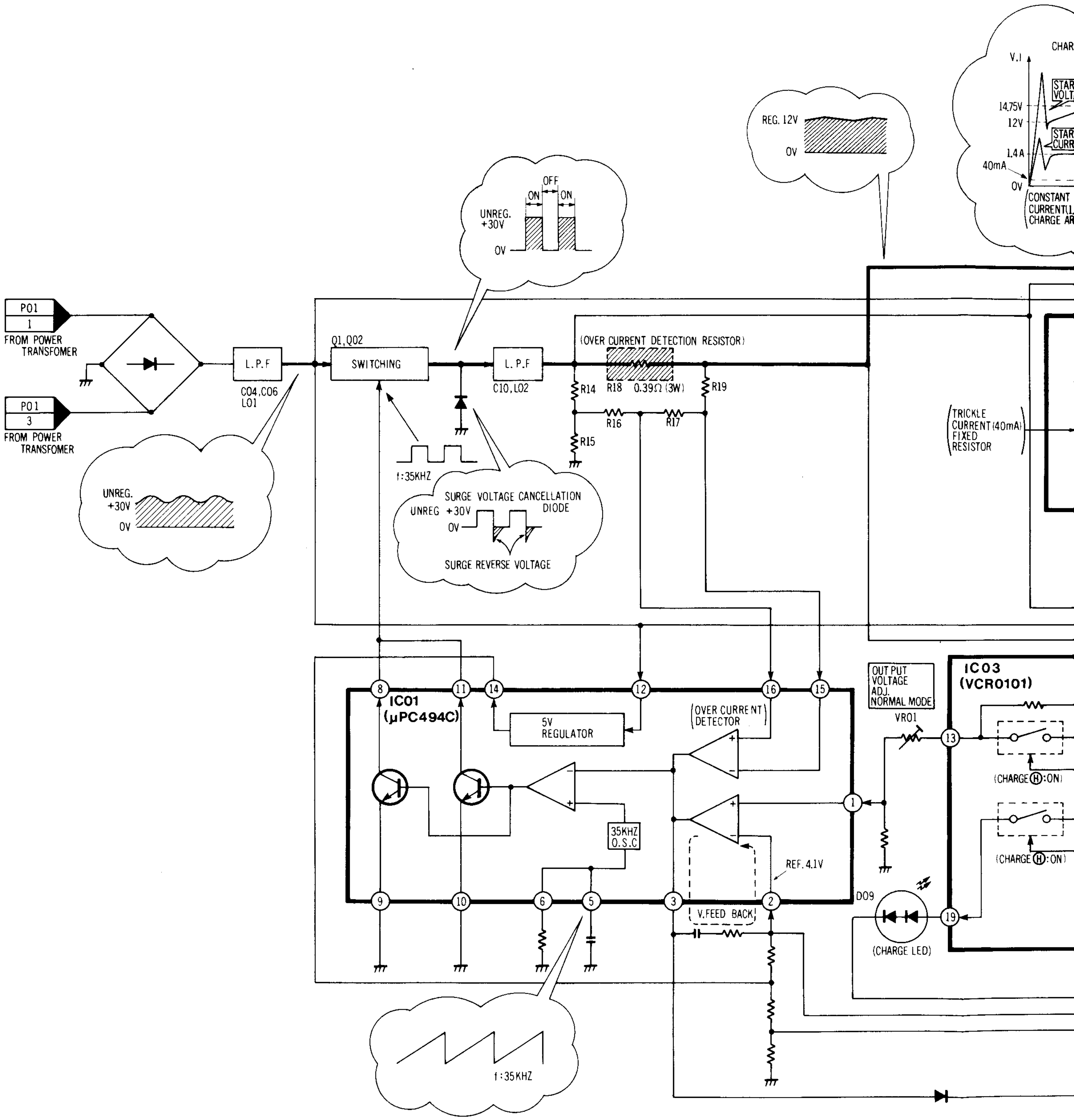
Fig. 8

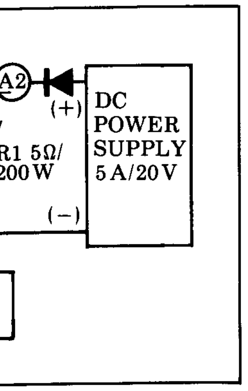
2. Adjust the output of the DC power supply so that the indication of the DC V.M. becomes 14.0 V and adjust R1 so that the indication of the DC A.M. (A2) becomes 3.0 [A].
3. Adjust VR02 so that the indication of the DC A.M. (A1) becomes 1.40 − 0.002 (25 − t) ± 0.02 [A].
4. Adjust the output level of the DC power supply till the indication of the oscilloscope becomes "Low" (about 0.5 V) from "High" (about 15.0 V).
5. If the value which was read in item 4 is not − 0.03 t ± 16.05 ± 0.1 V, turn VR03 clockwise or counterclockwise.

4. CIRCUIT BOARD LAYOUT


LED
C. Board
Front
C. Board
Primary
C. Board
Main
C. Board
Antenna
C. Board

5. BLOCK DIAGRAM


P01
1
FROM POWER
TRANSFOMER
P01
3
FROM POWER
TRANSFOMER
UNREG.
+30V
0V
L.P.F
C04,C06
L01
Q1,Q02
SWITCHING
UNREG.
+30V
0V
OFF
ON
ON
f:35KHZ
SURGE VOLTAGE CANCELLATION DIODE
UNREG +30V
0V
SURGE REVERSE VOLTAGE
L.P.F
C10,L02
(OVER CURRENT DETECTION RESISTOR)
R14
R18 0.39Ω (3W)
R19
R16
R17
R15
REG. 12V
0V
V.I
CHAR
STAR
VOLT
STAR
CURR
14.75V
12V
1.4A
40mA
0V
CONSTANT
CURRENT(1.
CHARGE AR
TRICKLE
CURRENT(40mA)
FIXED
RESISTOR
IC01
(μPC494C)
8
11
14
12
16
15
5V
REGULATOR
OVER CURRENT
DETECTOR
35KHZ
O.S.C
REF. 4.1V
V.FEED BACK
9
10
6
5
3
2
1
f:35KHZ
OUT PUT
VOLTAGE
ADJ.
NORMAL MODE
VR01
13
IC03
(VCR0101)
(CHARGE Ⓗ:ON)
(CHARGE Ⓗ:ON)
D09
19
(CHARGE LED)

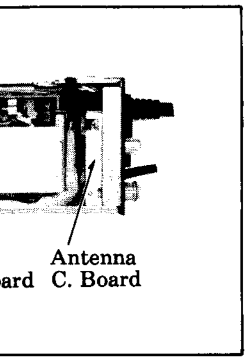

A2
(+)
DC
POWER
SUPPLY
5A/20V
R1 5Ω/
200W
(−)

y so that the indica-
djust R1 so that the
3.0[A].
the DC A.M. (A1)

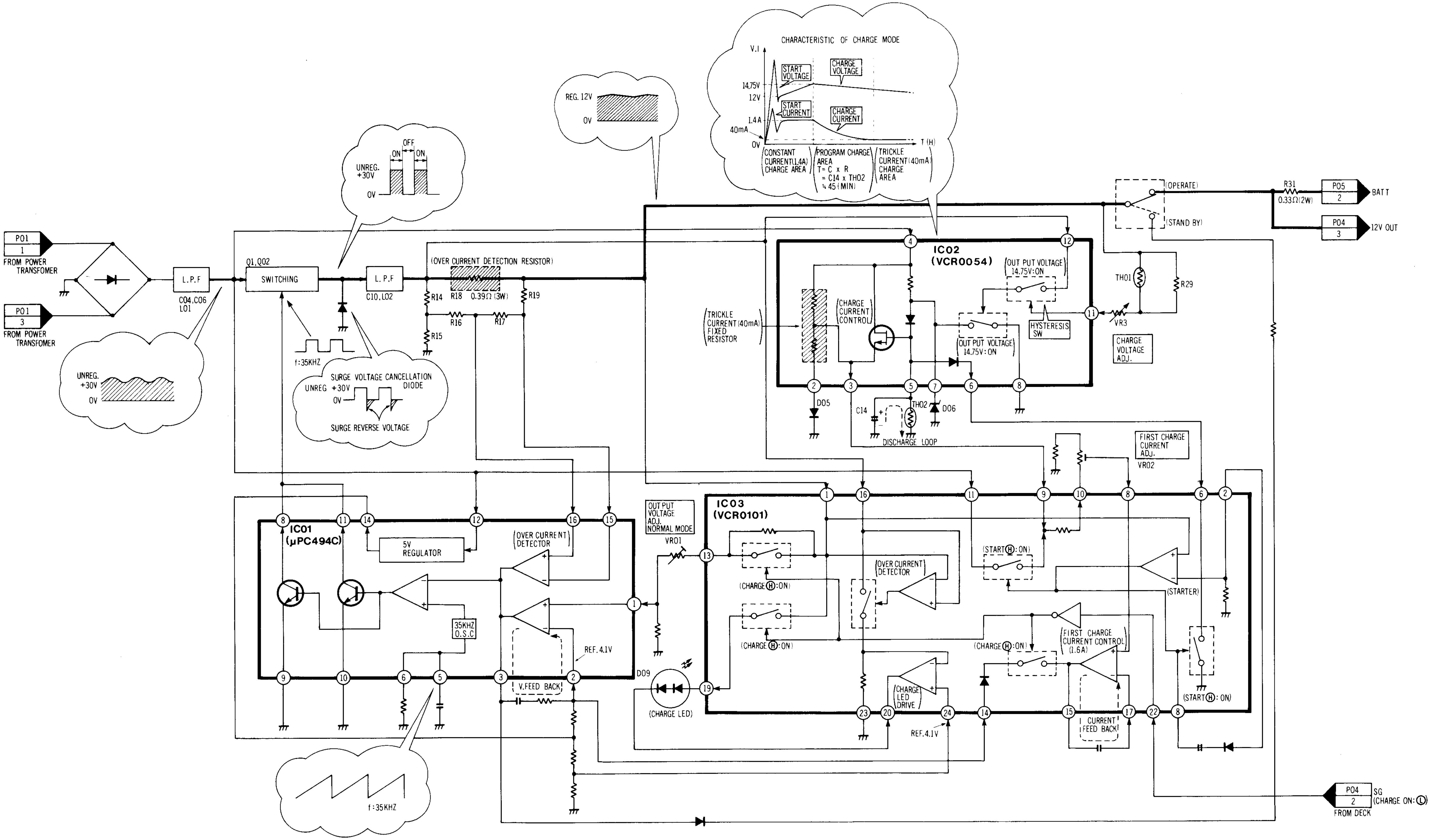
upply till the indica-
' (about 0.5V) from

ot −0.03t ± 16.05 ±
ckwise.

AYOUT

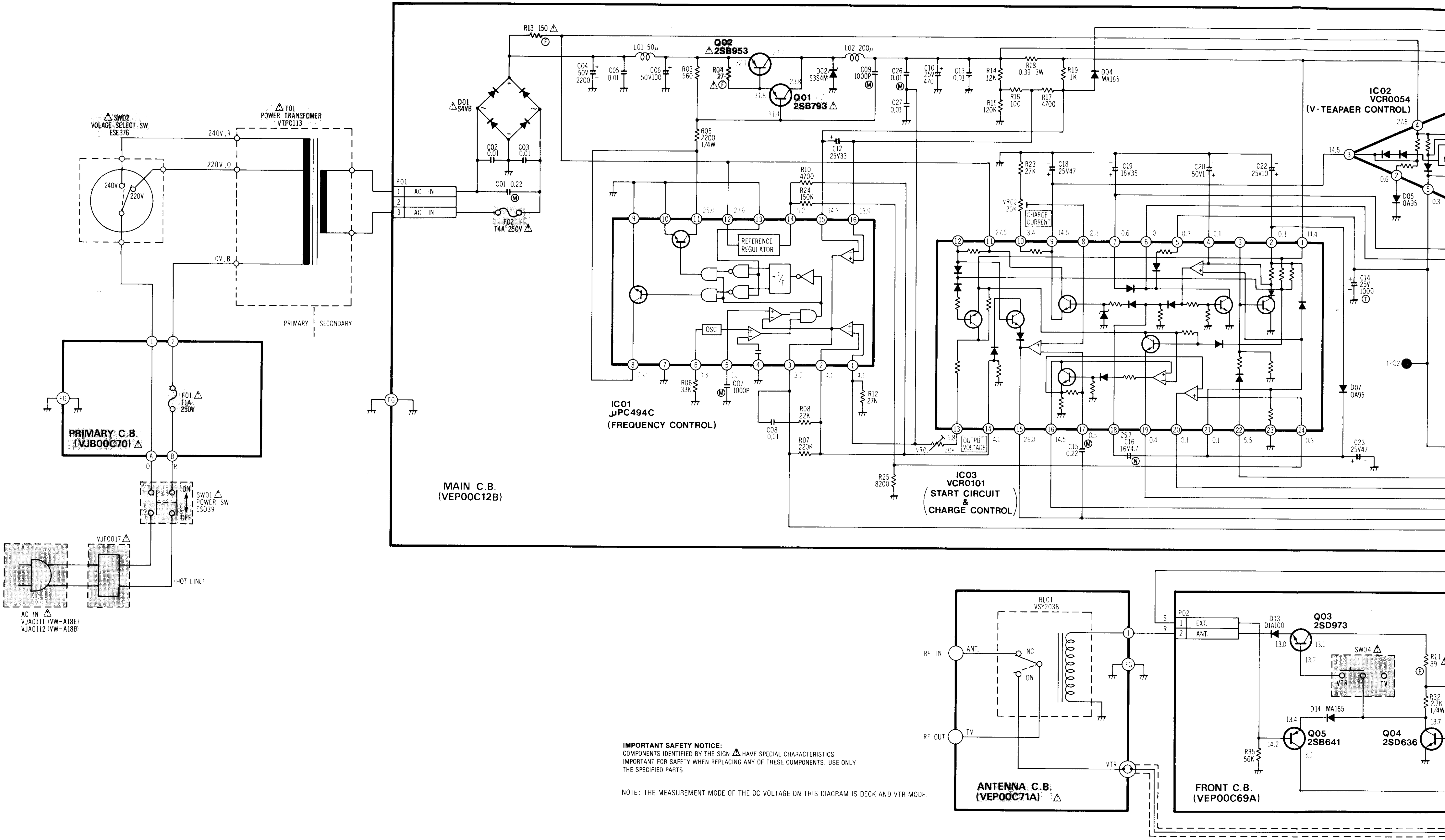

Antenna
ard C. Board

5. BLOCK DIAGRAM


CHARACTERISTIC OF CHARGE MODE
V.I
START VOLTAGE
CHARGE VOLTAGE
14.75V
12V
START CURRENT
CHARGE CURRENT
1.4A
40mA
0V
T (H)
(CONSTANT CURRENT(1.4A) CHARGE AREA)
(PROGRAM CHARGE AREA T = C x R = C14 x TH02 ≒ 45 (MIN))
(TRICKLE CURRENT (40mA) CHARGE AREA)
REG. 12V
0V
UNREG. +30V
OFF
ON
ON
0V
P01
1
FROM POWER TRANSFOMER
P01
3
FROM POWER TRANSFOMER
L.P.F
C04.C06
L01
Q1.Q02
SWITCHING
L.P.F
C10.L02
(OVER CURRENT DETECTION RESISTOR)
R14
R18 0.39Ω (3W)
R19
R16
R17
R15
f:35KHZ
SURGE VOLTAGE CANCELLATION DIODE
UNREG +30V
0V
SURGE REVERSE VOLTAGE
UNREG. +30V
0V
IC02
(VCR0054)
(OUT PUT VOLTAGE 14.75V:ON)
(TRICKLE CURRENT (40mA) FIXED RESISTOR)
(CHARGE CURRENT CONTROL)
(OUT PUT VOLTAGE 14.75V:ON)
HYSTERESIS SW
D05
C14
TH02
D06
DISCHARGE LOOP
(OPERATE)
(STAND BY)
TH01
R29
VR3
CHARGE VOLTAGE ADJ.
R31
0.33Ω (2W)
P05
2
BATT
P04
3
12V OUT
FIRST CHARGE CURRENT ADJ.
VR02
IC01
(μPC494C)
5V REGULATOR
(OVER CURRENT DETECTOR)
35KHZ O.S.C
REF. 4.1V
V. FEED BACK
OUT PUT VOLTAGE ADJ. NORMAL MODE
VR01
IC03
(VCR0101)
(CHARGE Ⓗ:ON)
(CHARGE Ⓗ:ON)
(OVER CURRENT DETECTOR)
(START Ⓗ:ON)
(STARTER)
(FIRST CHARGE CURRENT CONTROL (1.6A))
(CHARGE Ⓗ:ON)
(CHARGE LED DRIVE)
REF. 4.1V
CURRENT FEED BACK
(START Ⓗ: ON)
D09
(CHARGE LED)
f:35KHZ
P04
2
FROM DECK
SG
(CHARGE ON: Ⓛ)

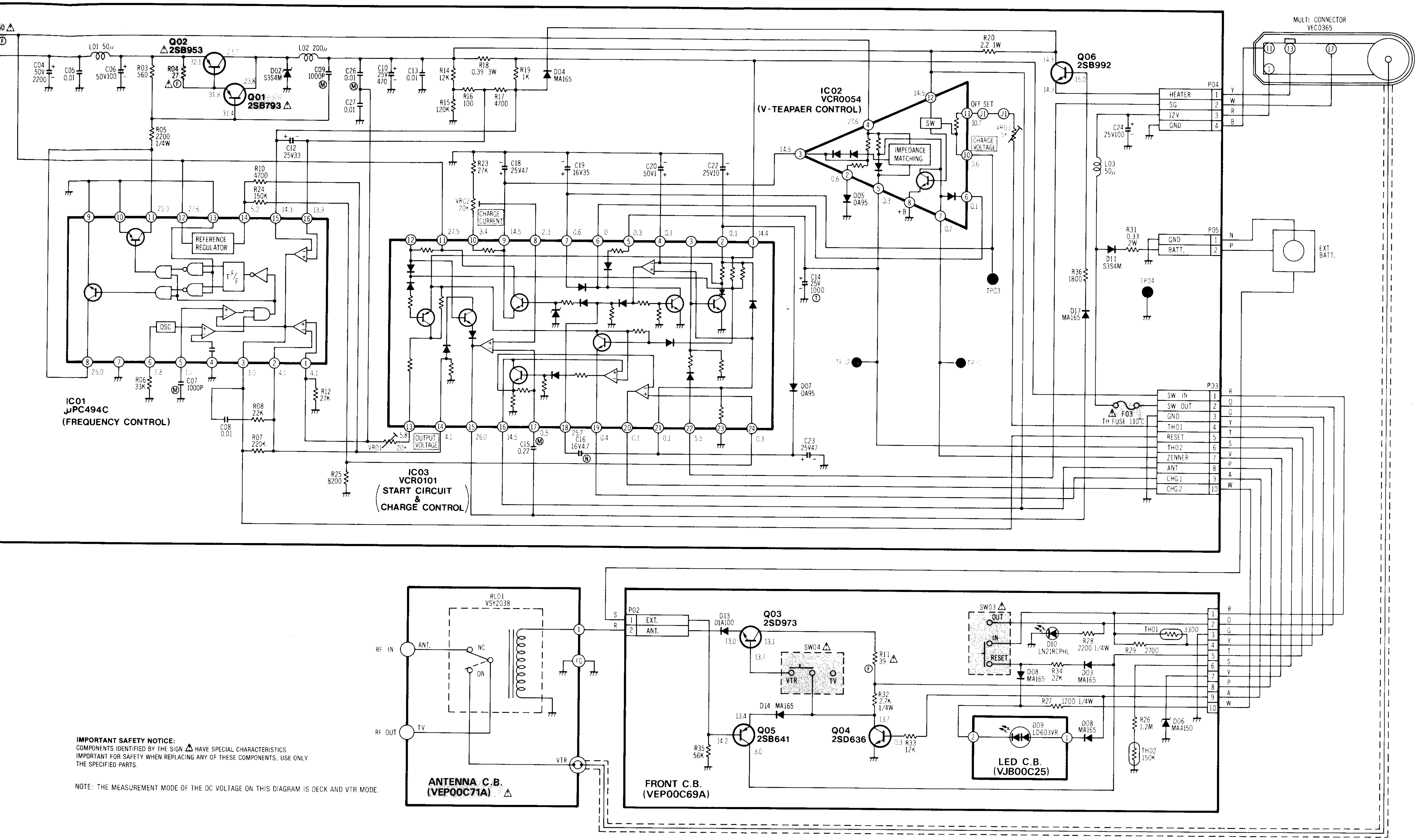
Next Page:
SCHEMATIC DIAGRAM

6. SCHEMATIC DIAGRAM


SW02 VOLAGE SELECT SW ESE376
240V
220V
T01 POWER TRANSFOMER VTP0113
240V,R
220V,0
0V,B
PRIMARY
SECONDARY
F01 T1A 250V
FG
PRIMARY C.B. (VJB00C70)
SW01 POWER SW ESD39
ON
OFF
VJF0017
HOT LINE
AC IN VJA0111 (VW-A18E) VJA0112 (VW-A18B)
P01
AC IN
AC IN
D01 S4VB
C02 0.01
C03 0.01
C01 0.22
F02 T4A 250V
R13 150
L01 50μ
Q02 2SB953
L02 200μ
C04 50V 2200
C05 0.01
C06 50V100
R03 560
R04 27
D02 S3S4M
C09 1000P
Q01 2SB793
C26 0.01
C27 0.01
C10 25V 470
C13 0.01
R14 12K
R18 0.39 3W
R19 1K
D04 MA165
R15 120K
R16 100
R17 4700
IC02 VCR0054 (V-TEAPAER CONTROL)
R05 2200 1/4W
C12 25V33
R10 4700
R24 150K
REFERENCE REGULATOR
T F/F
OSC
R06 33K
C07 1000P
R08 22K
R07 220K
C08 0.01
R12 27K
IC01 μPC494C (FREQUENCY CONTROL)
R23 27K
C18 25V47
C19 16V35
C20 50V1
C22 25V10
VR02 22K
CHARGE CURRENT
C14 25V 1000
TP02
D05 OA95
D07 OA95
C23 25V47
VR01 20K
OUTPUT VOLTAGE
C15 0.22
C16 16V4.7
R25 8200
IC03 VCR0101 (START CIRCUIT & CHARGE CONTROL)
MAIN C.B. (VEP00C12B)
RL01 VSY2038
RF IN
ANT.
NC
ON
RF OUT
TV
VTR
ANTENNA C.B. (VEP00C71A)
P02
EXT.
ANT.
S
R
D13 D1A100
Q03 2SD973
SW04 VTR TV
R11 39
R32 2.7K 1/4W
D14 MA165
Q05 2SB641
Q04 2SD636
R35 56K
FRONT C.B. (VEP00C69A)

IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED BY THE SIGN ⚠ HAVE SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SPECIFIED PARTS.

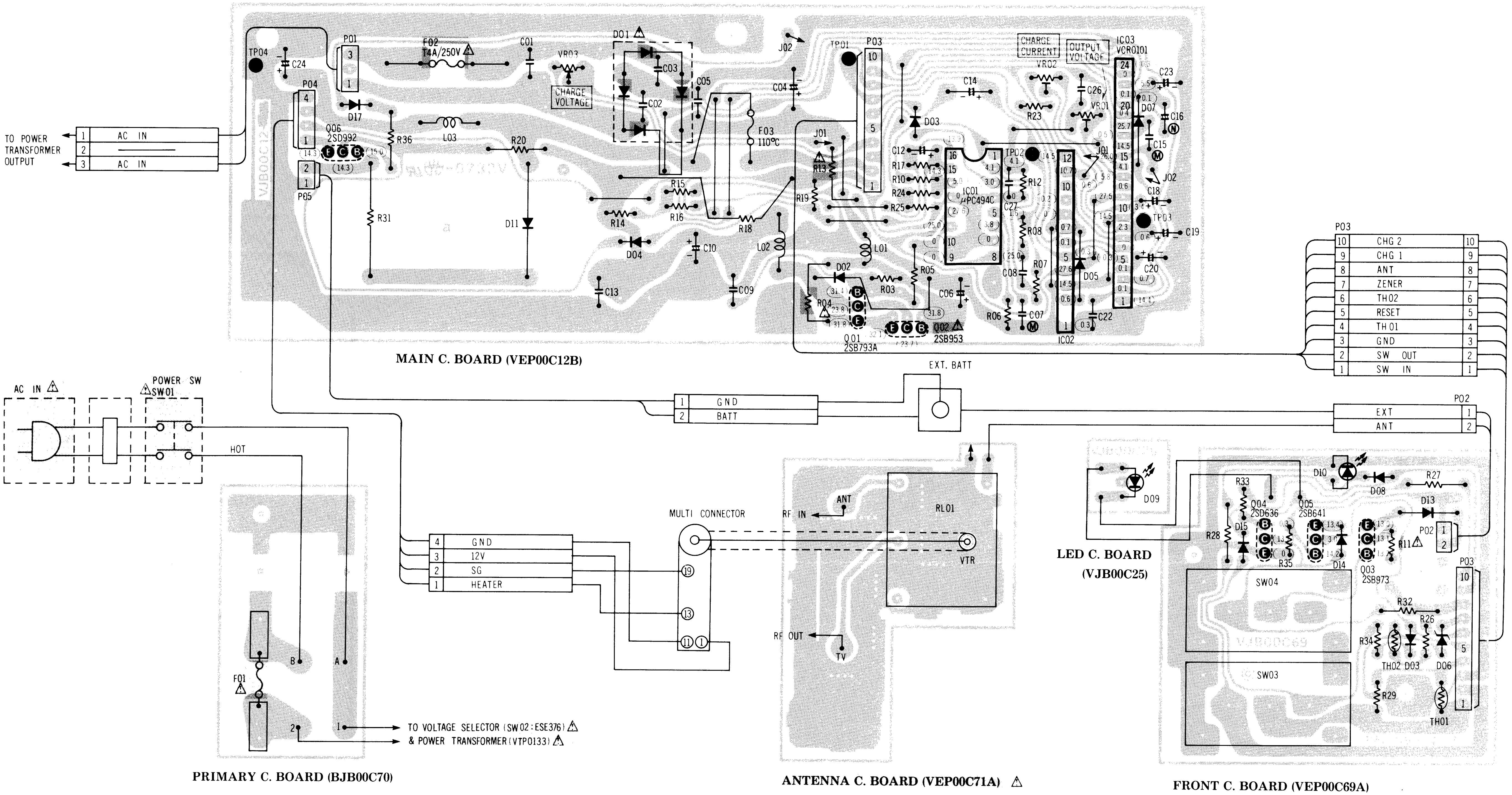
NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE ON THIS DIAGRAM IS DECK AND VTR MODE.


Q02
⚠2SB953
Q01
2SB793 ⚠
L01 50μ
L02 200μ
C04 50V 2200
C05 0.01
C06 50V100
R03 560
R04 27 ⚠Ⓕ
D02 S3S4M
C09 1000P Ⓜ
C26 0.01 Ⓜ
C27 0.01
C10 25V 470
C13 0.01
R14 12K
R15 120K
R18 0.39 3W
R16 100
R17 4700
R19 1K
D04 MA165
R20 2.2 1W
Q06
2SB992
MULTI CONNECTOR
VEC0365
R05 2200 1/4W
C12 25V33
R10 4700
R24 150K
IC02
VCR0054
(V-TEAPAER CONTROL)
SW
IMPEDANCE MATCHING
OFF SET
CHARGE VOLTAGE
D05 0A95
R23 27K
C18 25V47
C19 16V35
C20 50V1
C22 25V10
VR02 20K
CHARGE CURRENT
REFERENCE REGULATOR
OSC
IC01
μPC494C
(FREQUENCY CONTROL)
R06 33K
C07 1000P
R08 22K
C08 0.01
R07 220K
R12 27K
R25 8200
VR01 20K
OUTPUT VOLTAGE
C15 0.22
C16 16V4.7
IC03
VCR0101
(START CIRCUIT & CHARGE CONTROL)
C14 25V 1000 Ⓣ
D07 0A95
C23 25V47
TP03
TP04
P04
HEATER
SG
12V
GND
Y
W
R
B
C24 25V100
L03 50μ
R31 0.33 2W
D11 S3S4M
P05
GND
BATT.
N
P
EXT BATT.
R36 1800
D17 MA165
⚠ F03
TH FUSE 110°C
P03
SW IN
SW OUT
GND
TH01
RESET
TH02
ZENNER
ANT
CHG1
CHG2
R
O
G
Y
T
S
V
P
A
W
RL01
VSY2038
NC
ON
RF IN
ANT.
RF OUT
TV
FG
VTR
ANTENNA C.B.
(VEP00C71A) ⚠
P02
EXT.
ANT.
D13 D1A100
Q03
2SD973
SW04 ⚠
VTR
TV
R11 39 ⚠
R32 2.7K 1/4W
D14 MA165
Q05
2SB641
Q04
2SD636
R35 56K
R33 12K
FRONT C.B.
(VEP00C69A)
SW03 ⚠
OUT
IN
RESET
D10 LN21RCPHL
R28 2200 1/4W
TH01 3300
R29 2700
D08 MA165
R34 22K
D03 MA165
R27 1200 1/4W
D09 LD603VR
D08 MA165
LED C.B.
(VJB00C25)
R26 1.2M
D06 MA4150
TH02 150K

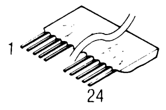
IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED BY THE SIGN ⚠ HAVE SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY WHEN REPLACING ANY OF THESE COMPONENTS. USE ONLY THE SPECIFIED PARTS.

NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE ON THIS DIAGRAM IS DECK AND VTR MODE.

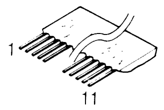
7. CIRCUIT BOARDS


TO POWER TRANSFORMER OUTPUT
AC IN
TP04
C24
P01
F02 T4A/250V
C01
VR03
CHARGE VOLTAGE
D01
C03
C02
C05
J02
TP01
P03
CHARGE CURRENT
OUTPUT VOLTAGE
IC03 VCR0101
C23
P04
Q06 2SD992
D17
R36
L03
R20
F03 110°C
C04
C14
VR02
C26
VR01
D07
C16
C15
D03
R23
J01
C12
R17
R10
R24
R25
IC01 µPC494C
TP02
R12
C27
J02
C18
TP03
C19
R13
R19
R15
R16
R14
R18
D04
C10
L02
L01
R08
D05
C20
P05
R31
D11
C13
C09
D02
R05
R03
C08
R07
C06
R04
Q01 2SB793A
Q02 2SB953
R06
C07
C22
IC02
MAIN C. BOARD (VEP00C12B)
CHG 2
CHG 1
ANT
ZENER
TH02
RESET
TH01
GND
SW OUT
SW IN
EXT. BATT
GND
BATT
P02
EXT
ANT
AC IN
POWER SW SW01
HOT
MULTI CONNECTOR
GND
12V
SG
HEATER
RF IN
ANT
RL01
VTR
RF OUT
TV
D09
LED C. BOARD (VJB00C25)
D10
D08
R27
R33
Q04 2SD636
Q05 2SB641
D13
R28
D15
R35
D14
Q03 2SB973
R11
SW04
R32
R26
R34
TH02
D03
D06
SW03
R29
TH01
F01
B
A
TO VOLTAGE SELECTOR (SW02: ESE376)
& POWER TRANSFORMER (VTP0133)
PRIMARY C. BOARD (BJB00C70)
ANTENNA C. BOARD (VEP00C71A)
FRONT C. BOARD (VEP00C69A)

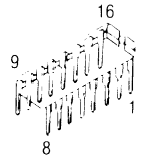
ICs & TRANSISTORs INFORMATION



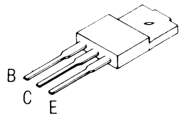
VCR0101



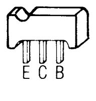
VCR0054



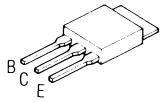
µPC494C



2SB953



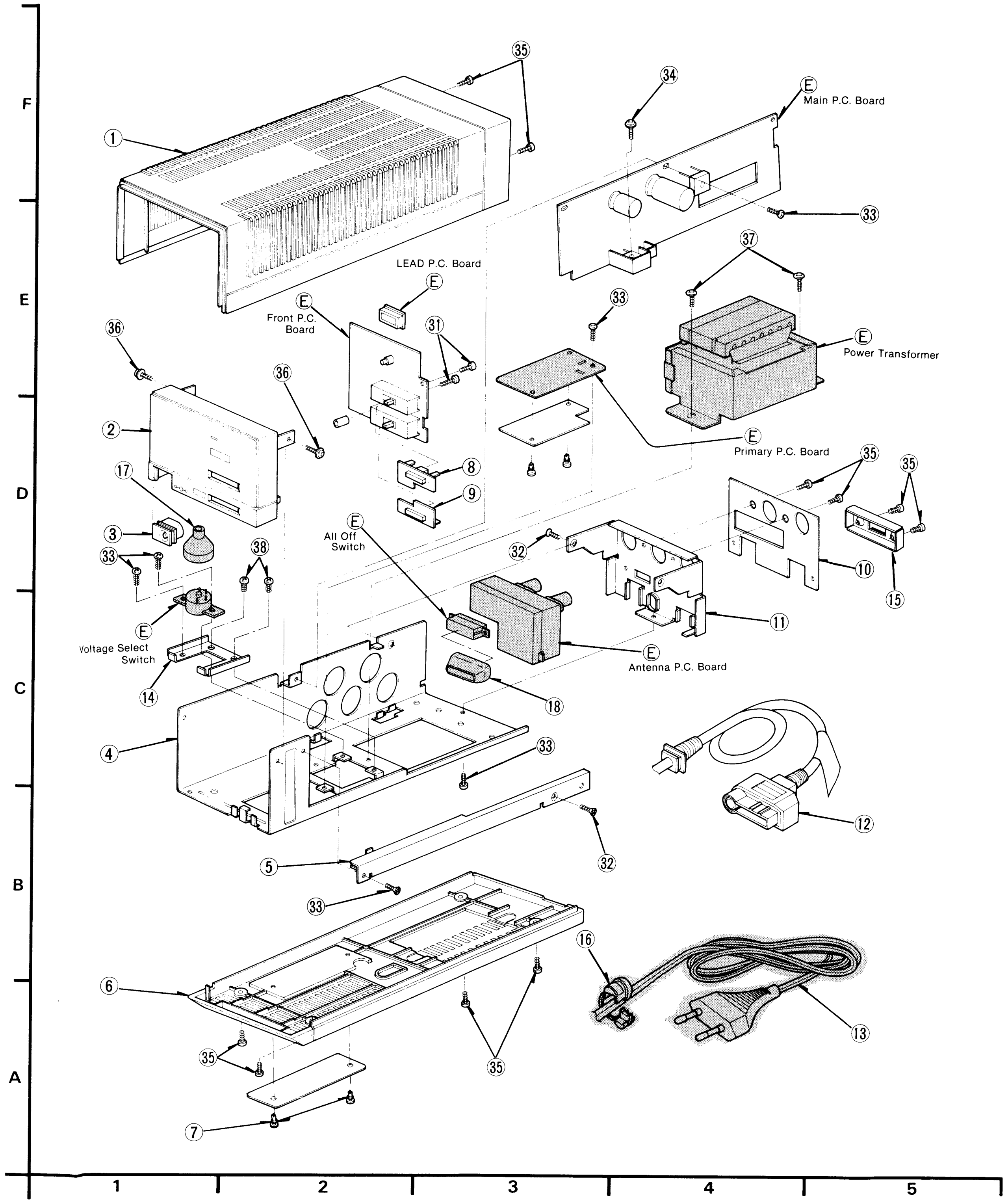
2SD636
2SB641
2SD973



2SD992

8. EXPLODED VIEWS

❶ CHASSIS & FRAME SECTION


㉟
㉞
Ⓔ Main P.C. Board
①
㉝
㊲
LEAD P.C. Board
Ⓔ
Ⓔ Front P.C. Board
㉛
㉝
Ⓔ Power Transformer
㊱
㊱
②
Ⓔ Primary P.C. Board
⑰
⑧
⑨
㉟
㉟
③
㉝
㊳
Ⓔ All Off Switch
㉜
⑩
⑮
Ⓔ Voltage Select Switch
⑪
Ⓔ Antenna P.C. Board
⑭
⑱
④
㉝
⑫
⑤
㉜
㉝
⑯
⑥
⑬
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㉟
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1
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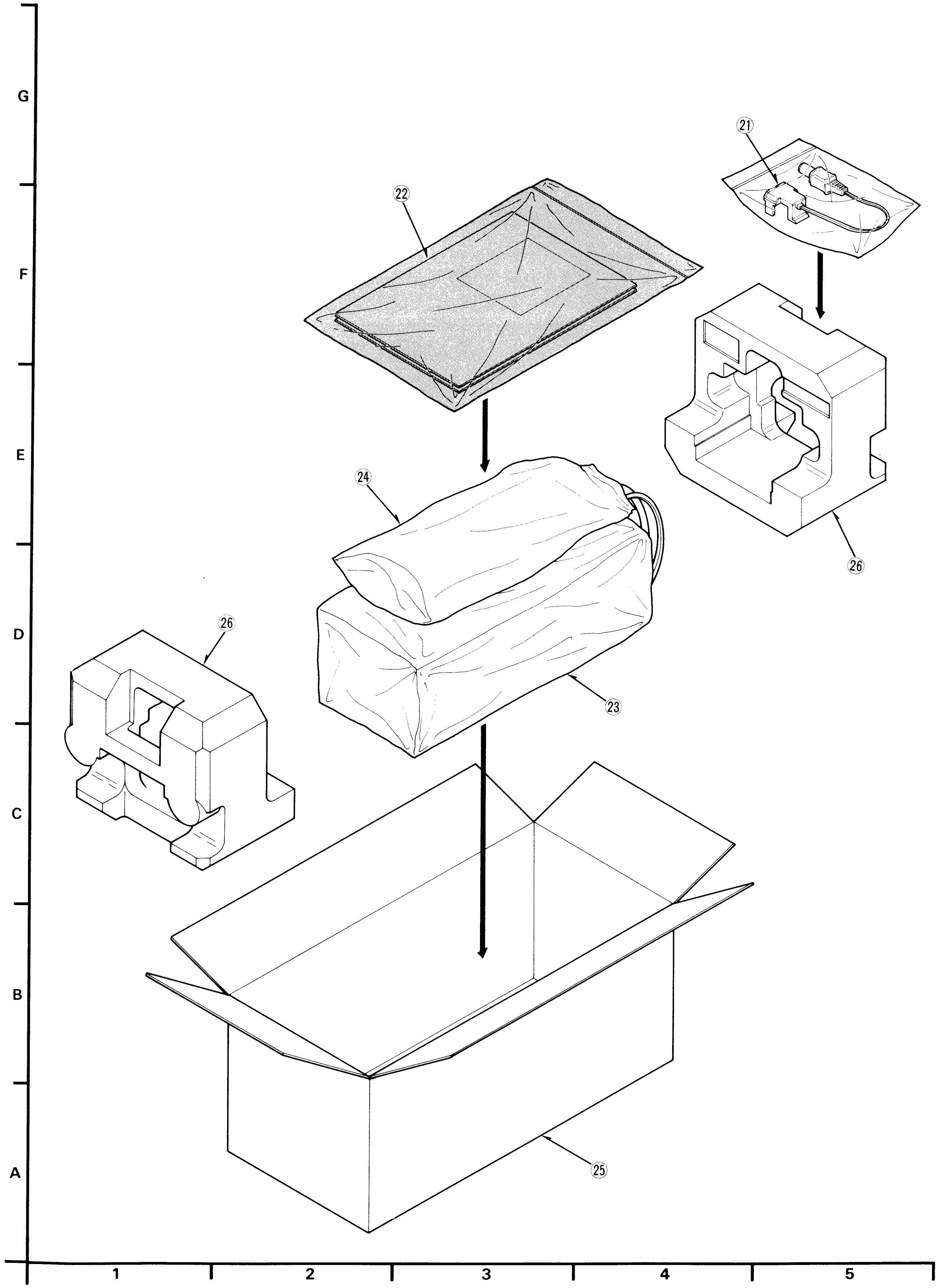
Back Page:
CIRCUIT BOARD

❷ PACKING PARTS SECTION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9. MECHANICAL REPLACEMENT PARTS LIST

Notes: 1. * Be sure to make your orders of replacement parts according to this list.
2. IMPORTANT SAFETY NOTICE
Components identified with the mark ⚠ have the special characteristics for safety. When replacing any of these components, use only the same type.

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
1(1)	VKM0270	Top Case	1	VW-A18E (Silver)
1(1)	VKM0351	Top Case	1	VW-A18E (Black)/B
2(1)	VYP0991	Front Panel Unit	1	VW-A18E (Silver)
2(1)	VYP1069	Front Panel Unit	1	VW-A18E (Black)/B
3(1)	VJS1036	External Socket	1	
4(1)	VMK0238	Chassis	1	
5(1)	VMP0418	Reinforcement Angle	1	
6(1)	VKM0316	Bottom Case	1	
7(1)	VHN0011	Nylon Latch	2	
8(1)	VGU1192	Antenna Switch Knob	1	
9(1)	VGU1191	Power Switch Knob	1	
10(1)	VGH0236	Rear Name Plate	1	
11(1)	VJH0308	Rear Frame	1	
12(1)	VEC0365	Multi Connector Unit	1	
13(1)	VJA0111	AC Cord	1	VW-A18E ⚠
13(1)	VJA0112	AC Cord	1	VW-A18B ⚠
14(1)	VMA6416	Voltage Selector Angle	1	
15(1)	VMP0484	All Off Switch Angle	1	
16(1)	VJF0017	AC Cord Bushing	1	⚠
17(1)	VMX0399	Voltage Selector Cover	1	⚠
18(1)	VMZ0580	All Off Switch Cover	1	⚠
21(2)	VJA0180	Battery Catcher	1	
22(2)	VQF1213	Fan Bag Kit	1	VW-A18E ⚠
22(2)	VQF1260	Fan Bag Kit	1	VW-A18B ⚠
23(2)	VPF0201	Polyethylene Bag	1	
24(2)	VPF0202	Polyethylene Bag (Cord)	1	
25(2)	VPG1674	Packing Case	1	VW-A18E (Silver)
25(2)	VPG1791	Packing Case	1	VW-A18E (Black)
25(2)	VPG1772	Packing Case	1	VW-A18B
26(2)	VPN0988	Cushion	2	
		Screws		
31(1)	XTV3+6J		2	
32(1)	XSS3+6FS		2	
33(1)	XTV3+6FS		6	
34(1)	XYN3+F8S		1	
35(1)	XSB3+6FZS		10	
36(1)	XYN3+B6FS		2	
37(1)	XTT4+5FS		2	
38(1)	XTN3+5FS		2	

10. ELECTRICAL REPLACEMENT PARTS LIST

Notes: 1. * Be sure to make your orders of replacement parts according to this list.
2. IMPORTANT SAFETY NOTICE
Components identified with the mark ⚠ have the special characteristics for safety. When replacing any of these components, use only the same type.
3. Unless otherwise specified,
All resistors are in OHMS (Ω), 1/4W ± 5% carbon. K=1,000Ω, M=1,000KΩ. All capacitors are in MICROFARADS (μF), ± 10% P=μμF.

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
	VEP00C12B	Main P.C. Board Unit	1	
	VEP00C69A	Front P.C. Board Unit	1	
	VEP00C71A	Antenna P.C. Board Unit	1	⚠
	VJB00C25	LED P.C. Board	1	
	VJB00C70	Primary P.C. Board	1	⚠
T01	VTP0113	Power Transformer	1	⚠
SW01	ESD3990S	All OFF Switch	1	⚠
SW02	ESE376	Voltage Select Switch	1	⚠
	VJR4	Clamper	1	
	VEP00C12B	Main P.C. Board Unit	1	
		Integrated Circuit		
IC01	μPC494C		1	
IC02	VCR0054		1	
IC03	VCR0101		1	
		Transistors		
Q01	2SB793A		1	
Q02	2SB953		1	(P,Q,V,B,V,T)
Q06	2SD992		1	⚠
		Diodes		
D01	S4VB		1	⚠
D02	S3S4MF3		1	
D04	MA165		1	
D05	0A95		1	
D07	0A95		1	
D11	S3S4MF1		1	
D17	MA165		1	

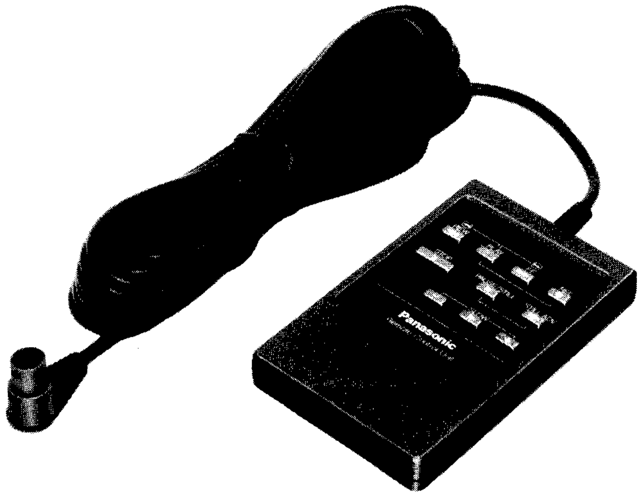
Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
		Resistors		
R03	ERDS2TJ561	560	1	
R04	ERQ14AJ270	Fuse 27	1	⚠
R05	ERD25TJ222	2.2K	1	
R06	ERDS2TJ333	33K	1	
R07	ERDS2TJ224	220K	1	
R08	ERDS2TJ223	22K	1	
R10	ERDS2TJ472	4.7K	1	
R12	ERDS2TJ273	27K	1	
R13	ERQ14AJ151	Fuse 150	1	⚠
R14	ERDS2TJ123	12K	1	
R15	ERDS2TJ124	120K	1	
R16	ERDS2TJ101	100	1	
R17	ERDS2TJ472	4.7K	1	
R18	ERF3AKR39	Cement 3W 0.39	1	
R19	ERDS2TJ102	1K	1	
R20	ERX1SJ2R2	Metal 1W 2.2	1	
R23	ERDS2TJ273	27K	1	
R24	ERDS2TJ154	150K	1	
R25	ERDS2TJ822	8.2K	1	
R30	ERDS2TJ101	100	1	
R31	ERX2ANJR33	Metal 2W 0.33	1	
R36	ERD25TJ182	1.8K	1	
		Variable Resistors		
VR01,02	EVN50AA00B24	20K	2	
VR03	EVN50AA00B53	5K	1	
		Capacitors		
C01	ECQV1H224JZ	Mylar 50V 0.22	1	
C02,03	ECKF1H103ZF	Ceramic 50V 0.01	2	
C04	ECEA1HU222	Electrolytic 50V 2200	1	
C05	ECKF1H103ZF	Ceramic 50V 0.01	1	
C06	ECEA1HG101S	Electrolytic 50V 100	1	
C07	ECQM1H102KV	Mylar 50V 1000P	1	
C08	ECKF1H103ZF	Ceramic 50V 0.01	1	
C09	ECQM1H102KV	Mylar 50V 1000P	1	
C10	ECEA1EG471S	Electrolytic 25V 470	1	
C12	ECEA1ES330	Electrolytic 25V 33	1	
C13	ECKF1H103ZF	Ceramic 50V 0.01	1	
C14	ECEA1EM102T	Electrolytic 25V 1000	1	
C15	ECQV1H224JZ	Mylar 50V 0.22	1	
C16	ECEA1EN4R7S	Electrolytic 25V 4.7	1	
C18	ECEA1ES470	Electrolytic 25V 47	1	
C19	ECEA1CS330	Electrolytic 16V 33	1	
C20	ECEA1HS010	Electrolytic 50V 1	1	
C22	ECEA1ES100	Electrolytic 25V 10	1	
C23	ECEA1ES470	Electrolytic 25V 47	1	
C24	ECEA1ES101	Electrolytic 25V 100	1	
C26	ECQV1H103JZ	Mylar 50V 0.01	1	
C27	ECKF1H103ZF	Ceramic 50V 0.01	1	
		Coils		
L01	VLQ0098	50µH	1	
L02	ELC15E001	200µH	1	
L03	VLQ0131	50µH	1	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
		Connectors		
P01	VJP1142	3P	1	
P03	VJP1146	10P	1	
P04	VJP1221	4P	1	
P05	VJP1148	2P	1	
		Fuses		
F02	XBA2C40TR0	250V 4A	1	⚠
F03	VSF0038	TH Fuse 110°C	1	
		Miscellaneous		
	VSC1121	Shield Case	1	
	TJC6320	Fuse Holder	2	⚠
	VEP00C69A	Front P.C. Board Unit		
		Transistors		
Q03	2SD973		1	
Q04	2SD636		1	or 2SC1684
Q05	2SB641		1	or 2SA564
		Diodes		
D03	MA165		1	
D06	MA4150M		1	
D08	MA165		1	
D10	LN21RCPHL	LED	1	
D13	D1A100		1	
D14,15	MA165		2	
		Resistors		
R11	ERQ14AJ390	Fuse 39	1	⚠
R26	ERDS2TJ125	1.2M	1	
R27	ERD25TJ122	1.2K	1	
R28	ERD25TJ222	2.2K	1	
R29	ERDS2TJ272	2.7K	1	
R32	ERD25TJ272	2.7K	1	
R33	ERDS2TJ123	12K	1	
R34	ERDS2TJ223	22K	1	
R35	ERDS2TJ563	56K	1	
		Connector		
P02	VJP1148	2P	1	
		Switches		
SW03,04	ESD27170		2	

Ref. No.		Part No.	Part Name & Description	Pcs / Set	Remarks
			Miscellaneous		
		KL04	LED Spacer	1	
		WZTC03B12	Tube	1	
		VEP00C71A	Antenna P.C. Board Unit	1	⚠
		VJB00C25	LED P.C. Board		
			Diode		
D09		LD603VR	LED	1	
		VJB00C70	Primary P.C. Board		⚠
			Fuse		
F01		XBA2C10TR0	250V 1A	1	⚠
			Miscellaneous		
		TJC6320	Fuse Holder	2	⚠
		VMZ0561	Barrier	2	⚠
		VHN0011	Nylon Latch	2	
		VMZ0429	Fuse Cover	1	⚠

Wired Remote Controller

VW-R17E



SPECIFICATIONS

Weight:	175g
Dimensions:	62(W) × 14(H) × 101(D) mm
Cable Length:	Approx. 5 m

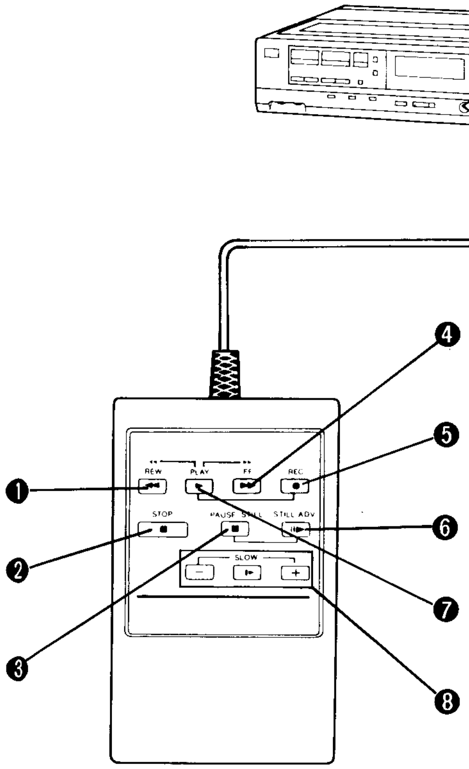
Weight and dimensions shown are approximate.

Specifications are subject to change without notice.

CONTENTS

1. CONTROLS AND COMPONENTS 1
2. SCHEMATIC DIAGRAM 2
3. CIRCUIT BOARD 2
4. EXPLODED VIEWS 3
5. MECHANICAL REPLACEMENT PARTS LIST 5
6. ELECTRICAL REPLACEMENT PARTS LIST 5

1. CONTROLS AND COMPONENTS



❶ **Rewind/Review Button**

Press this button to rewind tape. During the play mode pressing this button will allow you to view the tape in reverse at about 7 times the recorded tape speed.

❷ **STOP Button**

Press this button to stop the tape.

❸ **PAUSE/STILL Button**

Press this button to temporarily stop the tape movement in either the recording or playback mode. During playback, a super still picture is produced when the pause is in use. Press again to release pause.

❹ **Fast Forward/Cue Button**

Press this button to move the tape forward rapidly.
During the play mode pressing this button will allow you to view the tape in the forward direction at about 7 times the recorded tape speed.

❺ **REC Button**

Recording is started by pressing this button and the PLAY Button at the same time.

❻ **STILL ADV Button**

During viewing of super still picture, press this button to advance the picture one frame at a time.
Slow motion effects are obtainable by holding down the STILL ADV button (about 1/17 speed of normal playback).

❼ **PLAY Button**

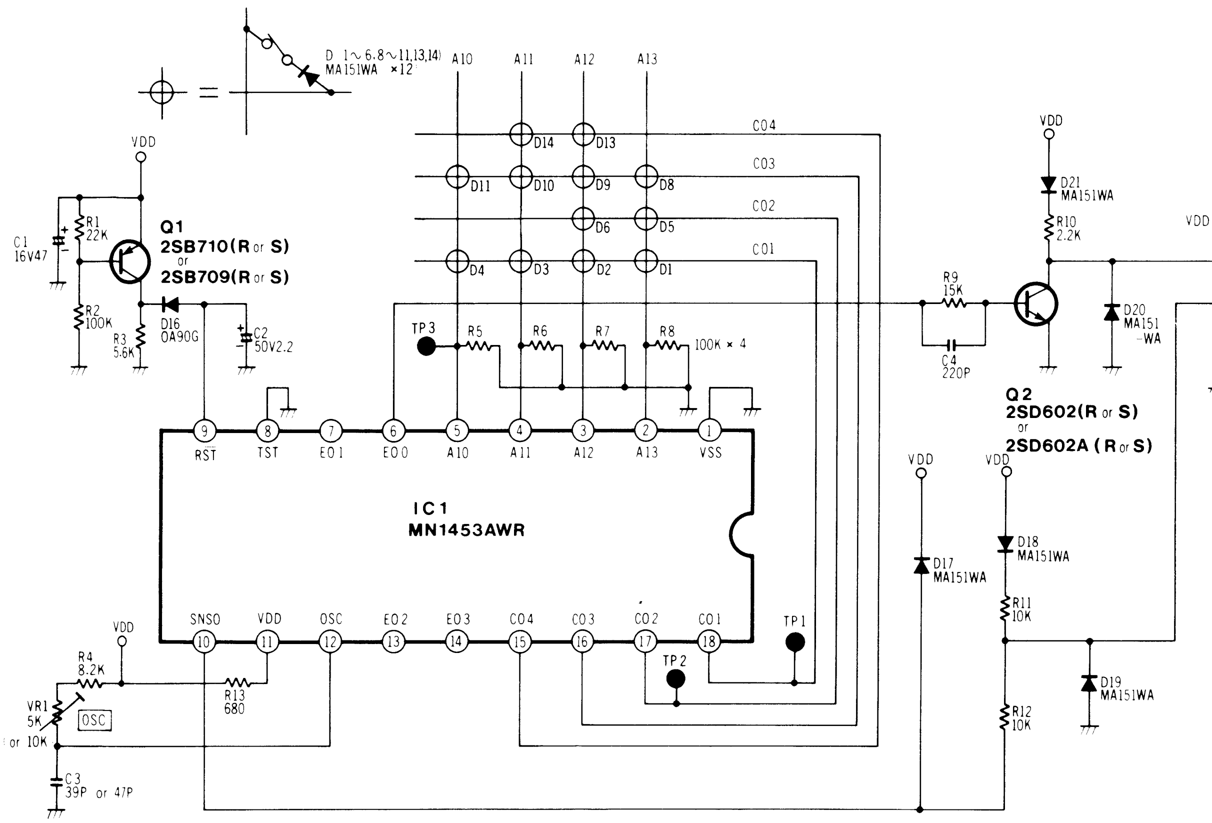
Press this button to playback recorded tapes.

❽ **Slow-Motion Buttons**

First press the SLOW Button (I▶) during playback to view a slow-motion picture. Press the "+" or "−" button to increase or decrease the speed of the SLOW-MOTION picture.

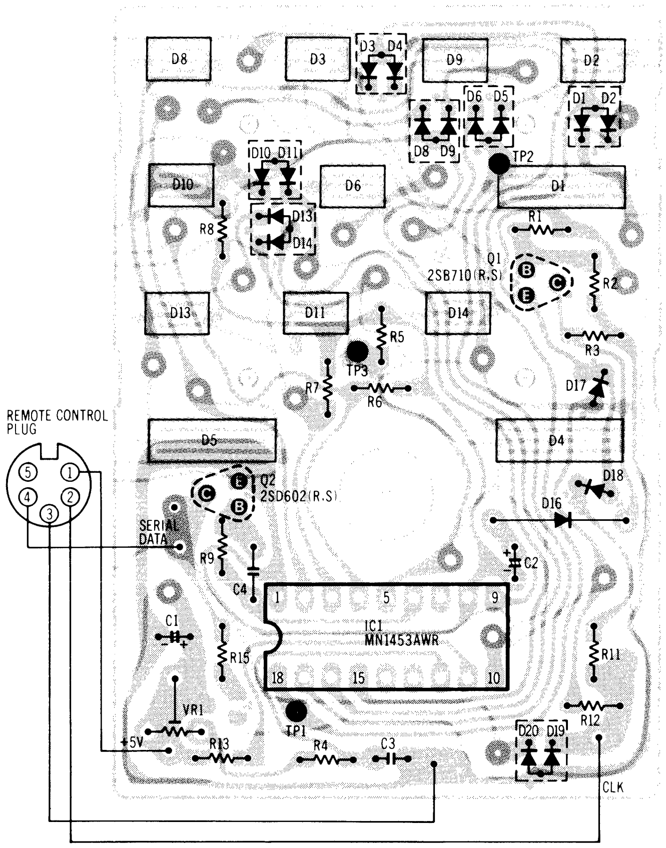
−	I▶	+
1/25 ~ 1/5 ~ 1/3		

2. SCHEMATIC DIAGRAM


D 1~6.8~11,13,14)
MA151WA ×12
A10
A11
A12
A13
VDD
C1
16V47
R1
22K
Q1
2SB710(R or S)
or
2SB709(R or S)
R2
100K
R3
5.6K
D16
OA90G
C2
50V2.2
C04
C03
C02
C01
D14
D13
D11
D10
D9
D8
D6
D5
D4
D3
D2
D1
TP3
R5
R6
R7
R8
100K × 4
9 RST
8 TST
7 EO1
6 EO0
5 A10
4 A11
3 A12
2 A13
1 VSS
IC1
MN1453AWR
10 SNSO
11 VDD
12 OSC
13 EO2
14 EO3
15 CO4
16 CO3
17 CO2
18 CO1
TP1
TP2
R4
8.2K
VR1
5K
or 10K
OSC
R13
680
C3
39P or 47P
D21
MA151WA
R10
2.2K
R9
15K
C4
220P
Q2
2SD602(R or S)
or
2SD602A (R or S)
D20
MA151
-WA
VDD
S OUT
CLK
GND
D17
MA151WA
D18
MA151WA
R11
10K
R12
10K
D19
MA151WA

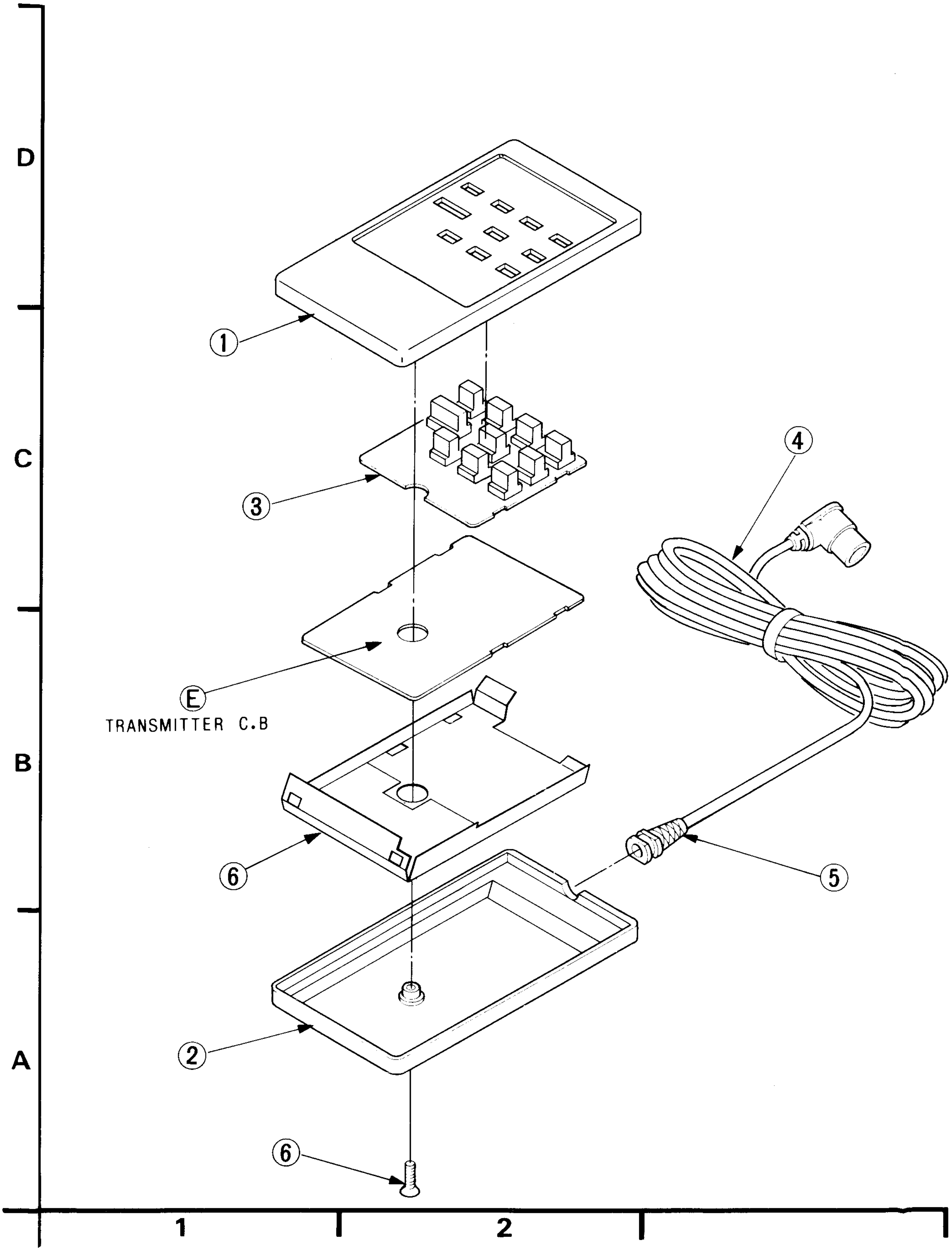
NO.	FUNCTION
D1	STOP
D2	REW
D3	FF
D4	REVIEW
D5	CUE
D6	STILL/PAUSE
D8	REC
D9	PLAY
D10	F. ADV
D11	SLOW × 1/2
D13	SLOW UP
D14	SLOW DOWN

3. CIRCUIT BOARD

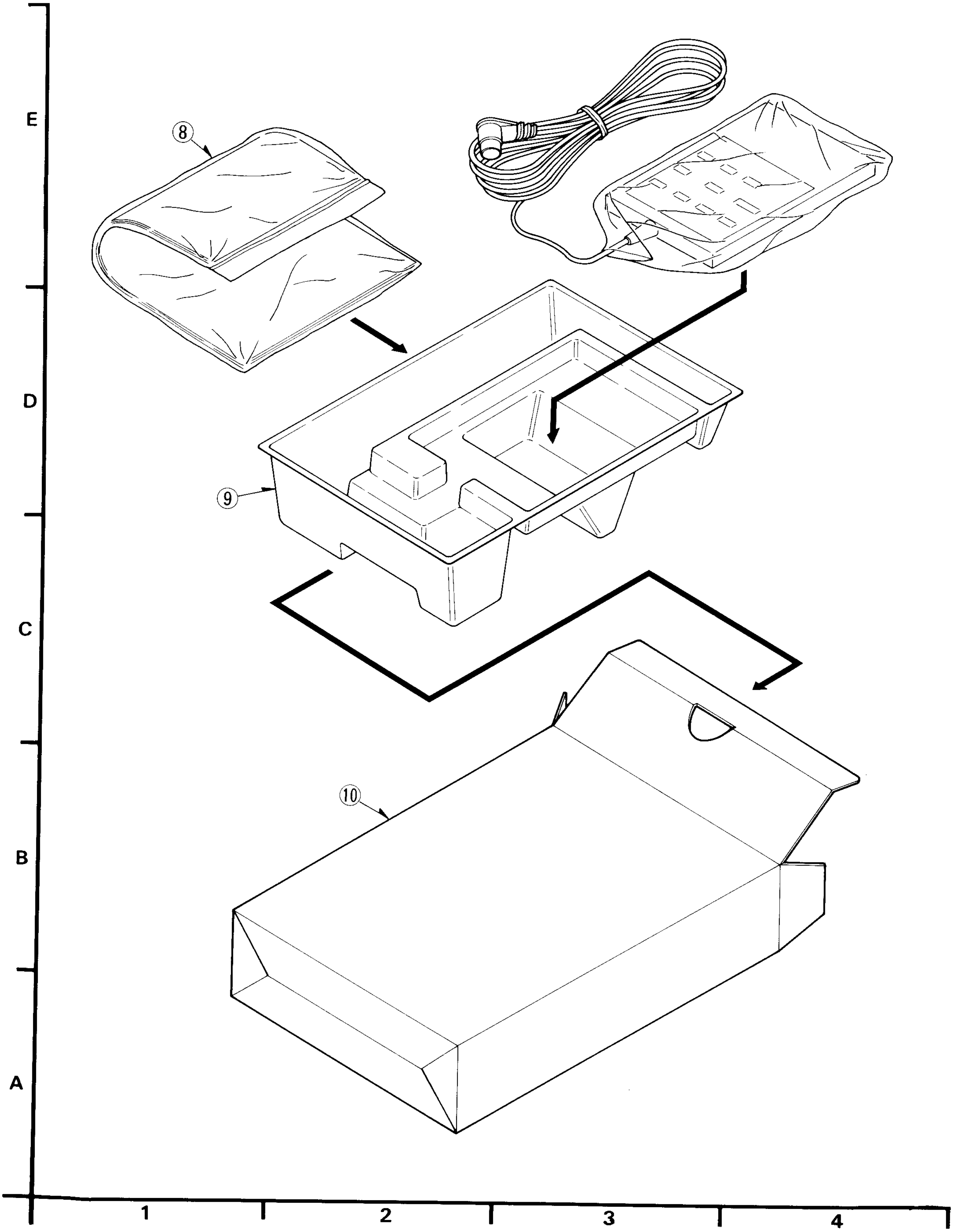

D8
D3
D3 D4
D9
D2
D6 D5
D1 D2
D8 D9
TP2
D10 D11
D10
D6
D1
R8
D13
D14
R1
Q1
2SB710(R.S)
R2
D13
D11
D14
R5
TP3
R3
R7
R6
D17
REMOTE CONTROL
PLUG
D5
D4
Q2
2SD602(R.S)
D18
D16
SERIAL
DATA
R9
C2
C4
1
5
9
IC1
MN1453AWR
C1
R15
18
15
10
R11
VR1
TP1
R12
+5V
R13
R4
C3
D20 D19
CLK

4. EXPLODED VIEW

❶ REMOTE CONTROL UNIT


D
C
B
A
1
2
①
②
③
④
⑤
⑥
⑥
Ⓔ
TRANSMITTER C.B

❷ PACKING PARTS SECTION


E
D
C
B
A
⑧
⑨
⑩
1
2
3
4

5. MECHANICAL REPLACEMENT PARTS LIST

Notes: 1. * Be sure to make your orders of replacement parts according to this list.
2. IMPORTANT SAFETY NOTICE
Components identified with the mark ⚠ have the special characteristics for safety. When replacing any of these components, use only the same type.

Ref. No.		Part No.	Part Name & Description	Pcs / Set	Remarks
1(1)		VYK0757	Top Case Unit	1	
2(1)		VYK0758	Bottom Case Unit	1	
3(1)		VCU1671	Rubber Contact	1	
4(1)		VJA0244	Cord Unit	1	
5(1)		VJF0134	Cord Bushing	1	
6(1)		VXA2145	Shield Board Unit	1	
7(1)		VSS26+10FC	Screw	1	
8(2)		VQF1223	Fan Bag Kit	1	
9(2)		VPN0819	Cushion	1	
10(2)		VPK0375	Packing Case	1	

6. ELECTRICAL REPLACEMENT PARTS LIST

Notes: 1. * Be sure to make your orders of replacement parts according to this list.
2. IMPORTANT SAFETY NOTICE
Components identified with the mark ⚠ have the special characteristics for safety. When replacing any of these components, use only the same type.
3. Unless otherwise specified,
All resistors are in OHMS (Ω), 1/4W ±5% carbon. K=1,000Ω, M=1,000KΩ. All capacitors are in MICROFARADS (μF), ±10% P=μμF.

Ref. No.		Part No.	Part Name & Description	Pcs / Set	Remarks
		VEP2211	Wired Remote Controller	1	
			P.C. Board Unit		
			Integrated Circuit		
IC1		MN1453AWR		1	
			Transistors		
Q1		2SB710			(R,S) or
					2SB710A (R,S) or
					2SB709(R,S)
Q2		2SD602		1	(R,S) or
					2SB602A (R,S)
			Diodes		
D1-6		MA151WA		3	
D8-11		MA151WA		2	
D13,14		MA151WA		1	
D16		OA90G		1	
D17,18		MA151WA		2	
D19,20		MA151WA		1	or MA152WA
D21		MA151WA		1	
			Resistors		
R1		ERJ8GCSJ223	Chip 22K	1	
R2		ERJ8GCSJ104	Chip 100K	1	
R3		ERJ8GCSJ562	Chip 5.6K	1	
R4		ERJ8GCSJ822	Chip 8.2K	1	
R5-8		ERJ8GCSJ104	Chip 100K	4	
R9		ERJ8GCSJ153	Chip 15K	1	
R10		ERJ8GCSJ222	Chip 2.2K	1	
R11,12		ERJ8GCSJ103	Chip 10K	2	
R13		ERJ8GCSJ681	Chip 680	1	
			Variable Resistors		
VR1		EVNB4AA00B53	5K	1	
			Capacitors		
C1		ECEA1CK470	Electrolyitc 16V 47	1	
C2		ECEA1HK2R2	Electrolytic 50V 2.2	1	
C3		ECCF1H470JU	Ceramic 50V 47P	1	
C4		ECKF1H221KB	Ceramic 50V 220P	1	

Plug In AC Adaptor

VW-A11$^{E}_{B}$

Panasonic
Plug-in AC Adaptor
CAUTION
PRECAUTION
ACHTUNG
CHARGE
EXT. BATTERY
OUTPUT

SPECIFICATIONS

Power Source:	100 ~ 240 V AC, 50/60 Hz
Power Consumption:	25 W
DC OUT:	12 V 1.2 A
Weight:	0.35 kg
Dimensions:	24(W) × 62(H) × 182(D) mm

Weight and dimensions shown are approximate.
Specifications are subject to change without notice.

CONTENTS

1. ELECTRICAL ADJUSTMENT PROCEDURES 1
2. BLOCK DIAGRAM 1
3. SCHEMATIC DIAGRAM 2
4. CIRCUIT BOARD 3
5. EXPLODED VIEWS 4
6. MECHANICAL REPLACEMENT PARTS LIST 5
7. ELECTRICAL REPLACEMENT PARTS LIST 5

1. ELECTRICAL ADJUSTMENT PROCEDURES

This section provides complete electrical adjustment procedures which may be required for electrical circuit of the Plug In AC Adaptor VW-A11.

1-1 TEST EQUIPMENTS

To perform the electrical adjustments completely, following equipments are required.

1. D.V.M. (Digital Volt Meter)
   Voltage Range: 0.01 ~ 50 V
2. DC A.M. (DC Ammeter)
   Current Range: 0 ~ 10 A
3. Resistor (20Ω variable/5 W)
4. Resistor (470Ω/1 W)

1-2. OUTPUT VOLTAGE ADJUSTMENT

TP	ADJ.	MODE	INPUT
ELECTRODE (+), (−)	VR202	POWER SUPPLY	
TAPE	**M. EQ.**	**SPEC.**	
	D.V.M DC A.M.	13.5 ± 0.5 V	

1. Make the connection as shown below.

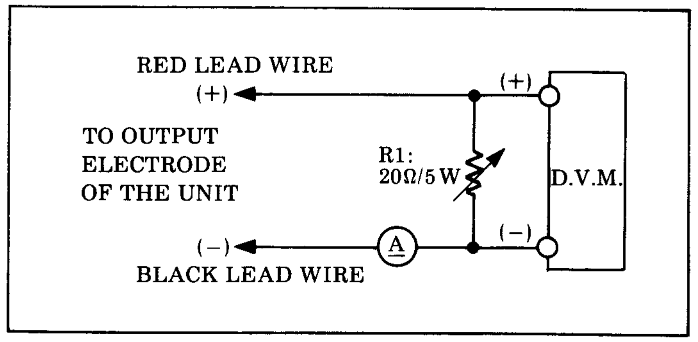

RED LEAD WIRE
(+)
TO OUTPUT ELECTRODE OF THE UNIT
R1: 20Ω/5 W
(+)
D.V.M.
(−)
(−)
A
BLACK LEAD WIRE

Fig. 1

2. Adjust R1 (20Ω variable/5 W) so that the indication of the DC A.M. is 1.2 A.
3. Adjust VR202 so that the indication of the D.V.M. is 13.5 ± 0.5 V.

Note:

After making this adjustment, readjust the CHARGE VOLTAGE (VR201).

1-3. CHARGE VOLTAGE ADJUSTMENT

TP	ADJ.	MODE	INPUT
PLUG CORD (+), (−)	VR201	CHARGE	
TAPE	**M. EQ.**	**SPEC.**	
	D.V.M. DC A.M.	$-\frac{3}{100}t+15.45$ (V) t: Ambient Temperature (°C)	

1. Connect the Battery Charging Cord to the socket of this unit and make the connection as shown below.

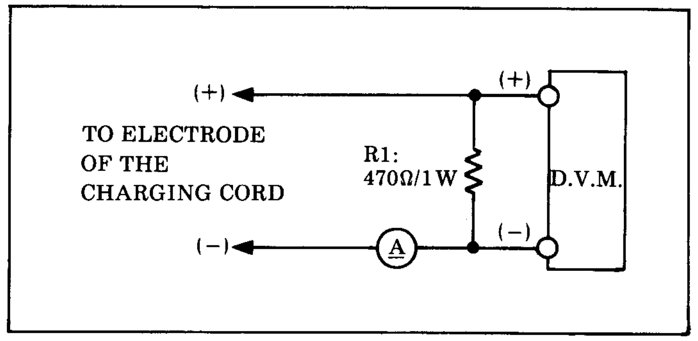
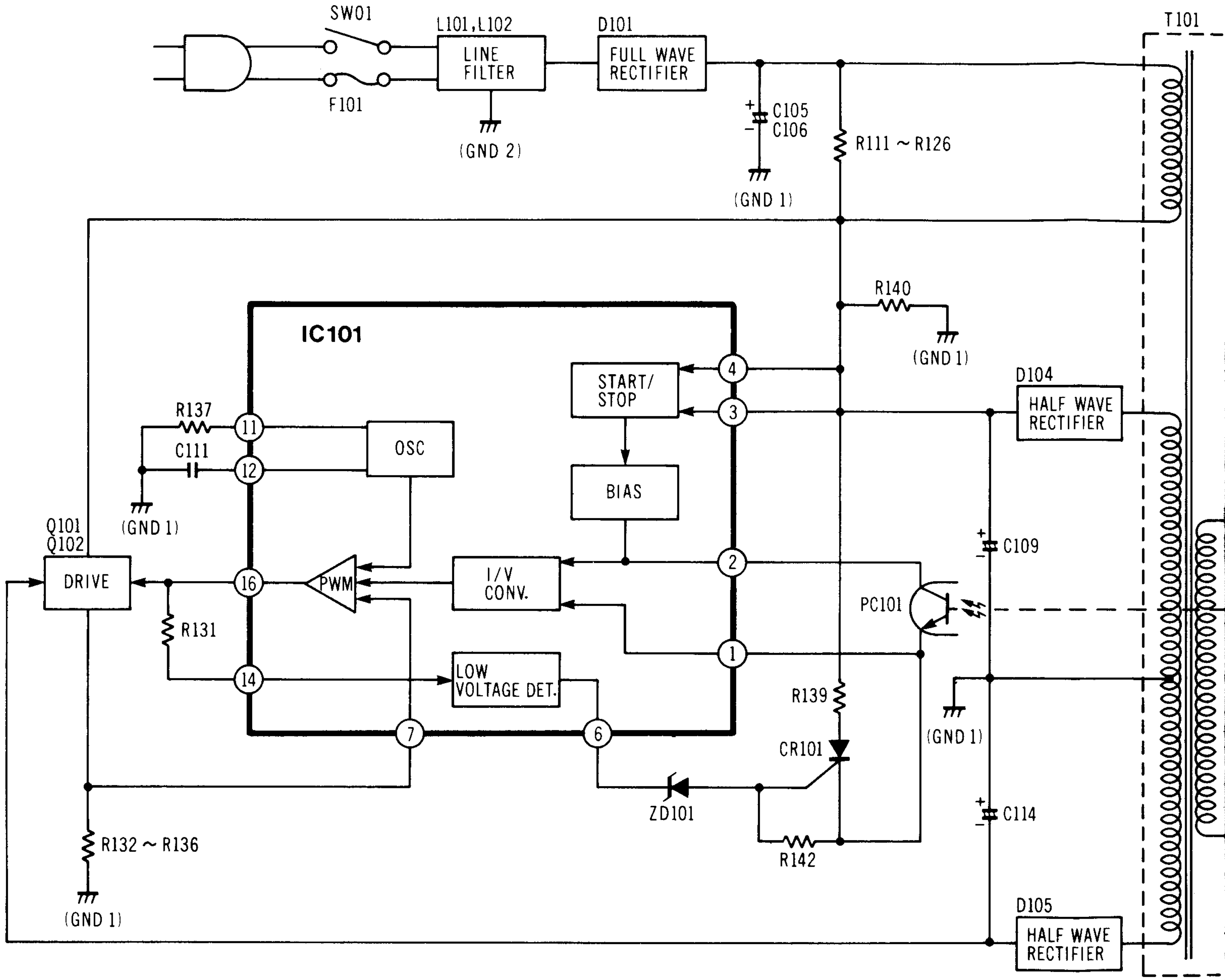

(+)
TO ELECTRODE OF THE CHARGING CORD
R1: 470Ω/1 W
(+)
D.V.M.
(−)
(−)
A

Fig. 2

2. Adjust VR201 so that the indication of the D.V.M. is $-0.03t+15.45$ V DC.

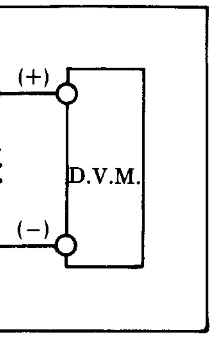
2. BLOCK DIAGRAM


SW01
F101
L101, L102
LINE FILTER
(GND 2)
D101
FULL WAVE RECTIFIER
C105
C106
(GND 1)
R111 ~ R126
T101
R140
(GND 1)
IC101
START/ STOP
BIAS
OSC
I/V CONV.
PWM
LOW VOLTAGE DET.
4
3
2
1
11
12
16
14
7
6
R137
C111
(GND 1)
Q101
Q102
DRIVE
R131
R132 ~ R136
(GND 1)
D104
HALF WAVE RECTIFIER
C109
PC101
(GND 1)
R139
CR101
ZD101
R142
C114
D105
HALF WAVE RECTIFIER

MENT

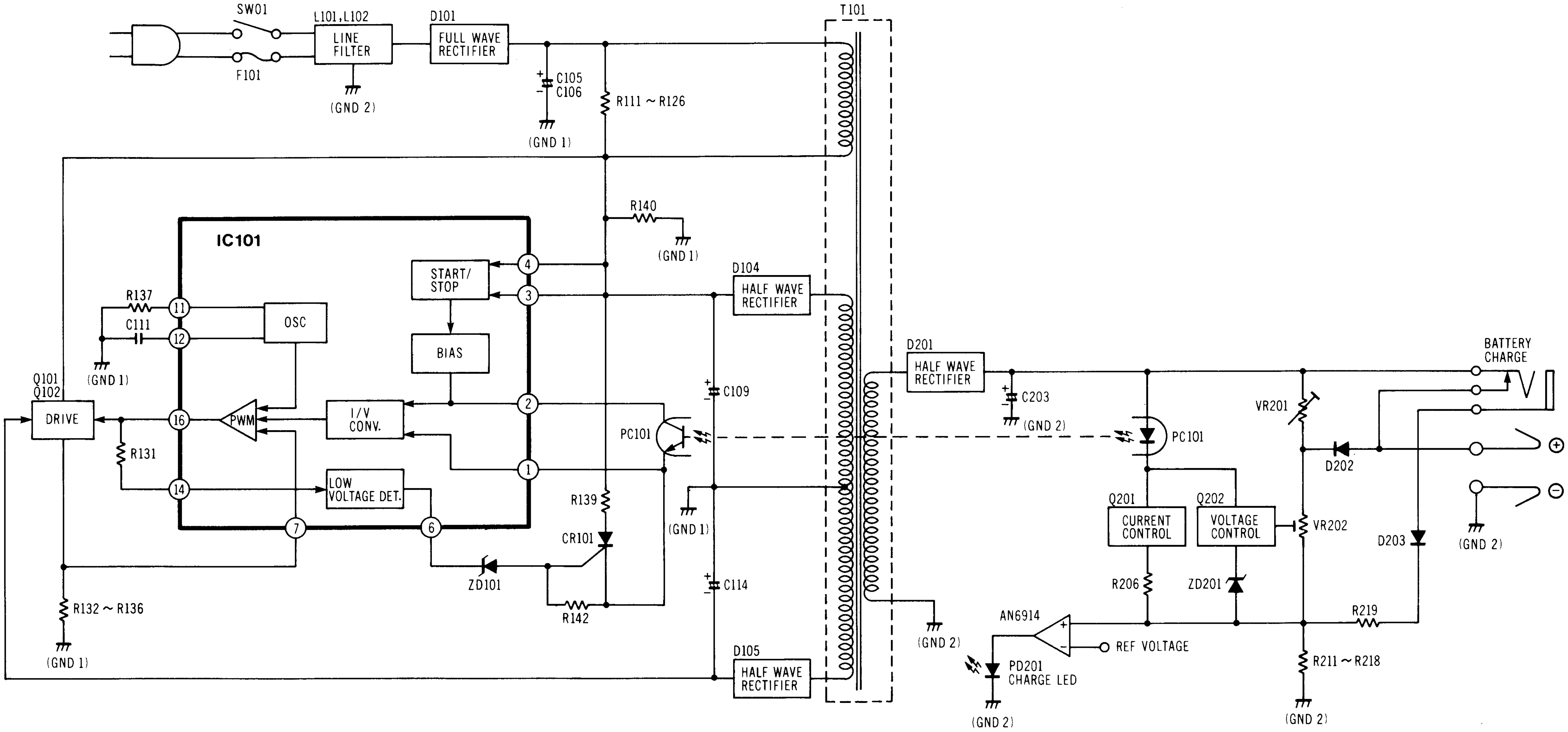
INPUT
EC.
5 (V) mperature

cket of this unit



.V.M. is −0.03t

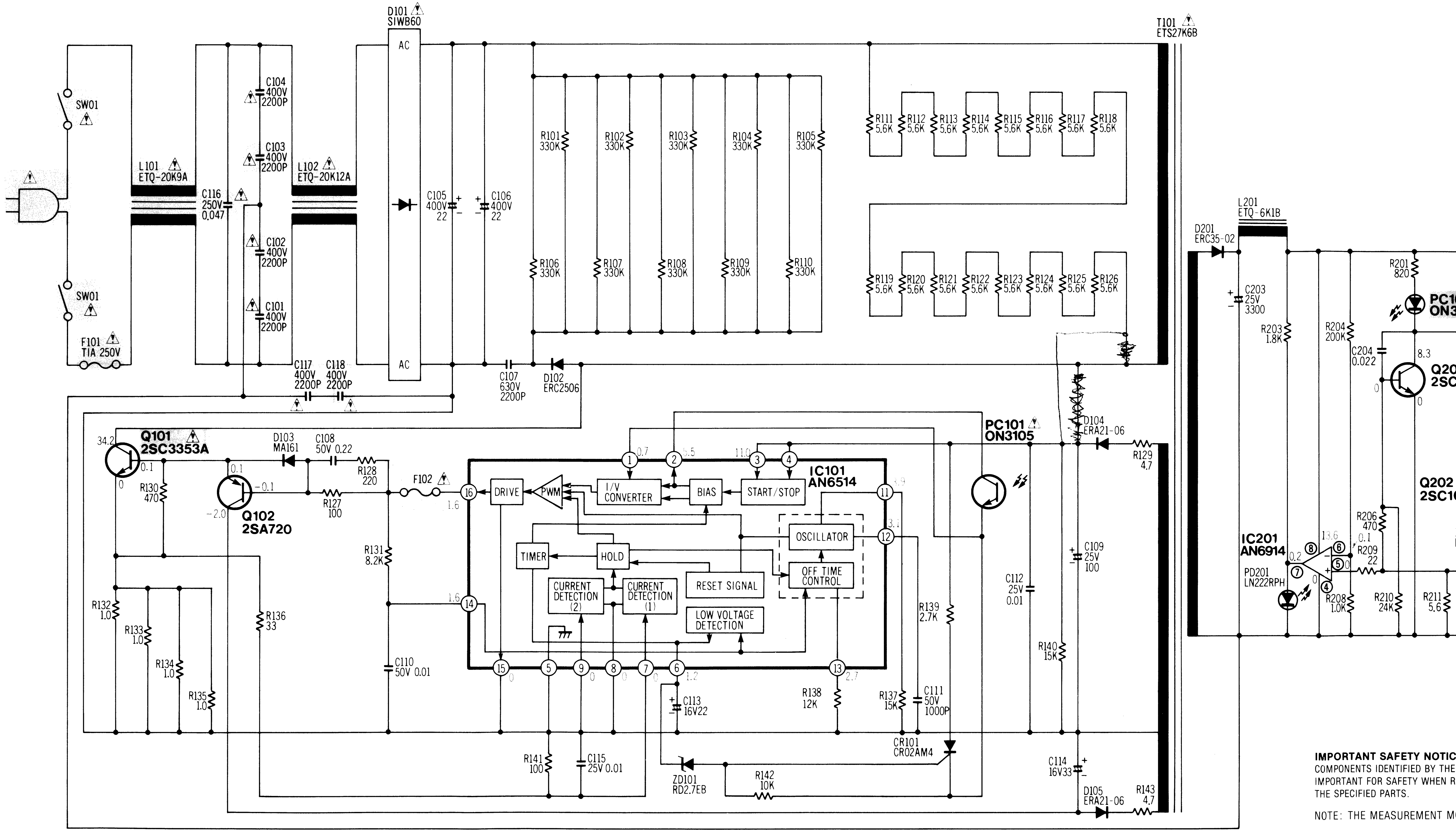
2. BLOCK DIAGRAM



SW01
F101
L101, L102
LINE FILTER
(GND 2)
D101
FULL WAVE RECTIFIER
C105
C106
(GND 1)
R111 ~ R126
T101
R140
(GND 1)
IC101
START/ STOP
BIAS
OSC
PWM
I/V CONV.
LOW VOLTAGE DET.
R137
C111
(GND 1)
Q101
Q102
DRIVE
R131
R132 ~ R136
(GND 1)
D104
HALF WAVE RECTIFIER
C109
PC101
R139
CR101
ZD101
R142
(GND 1)
C114
D105
HALF WAVE RECTIFIER
(GND 2)
D201
HALF WAVE RECTIFIER
C203
(GND 2)
PC101
Q201
CURRENT CONTROL
Q202
VOLTAGE CONTROL
R206
ZD201
AN6914
REF VOLTAGE
PD201
CHARGE LED
(GND 2)
VR201
VR202
D202
D203
R219
R211 ~ R218
(GND 2)
BATTERY CHARGE
⊕
⊖
(GND 2)

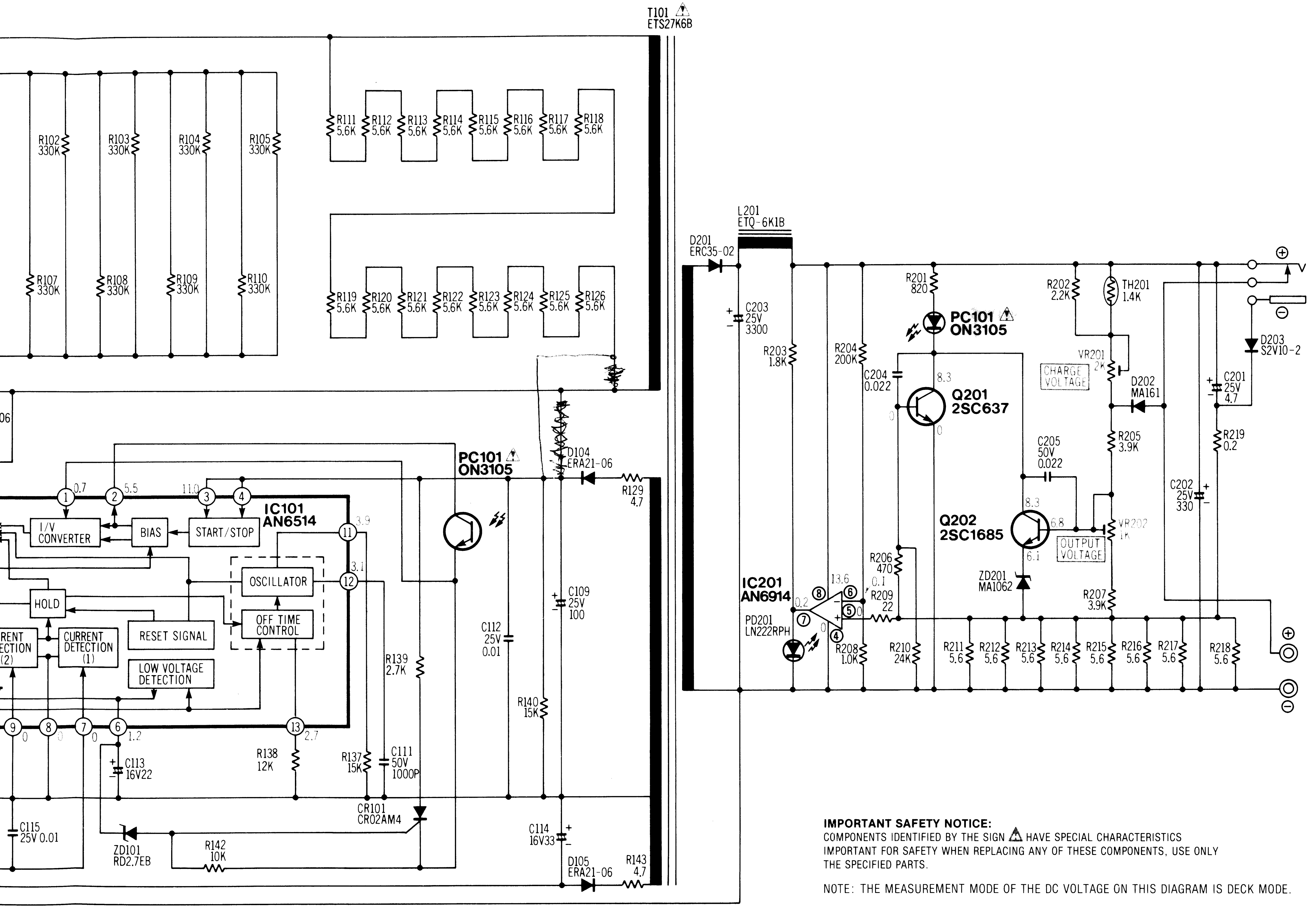
Next Page:
SCHEMATIC DIAGRAM

3. SCHEMATIC DIAGRAM

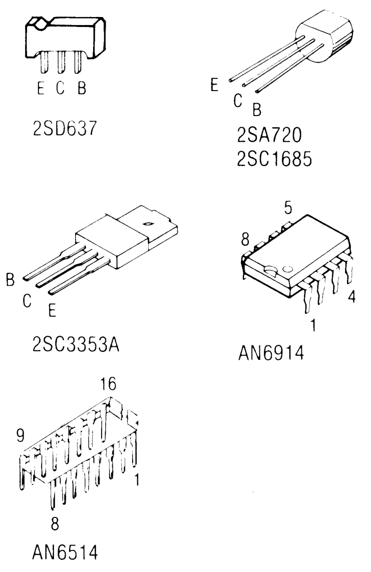

SW01
SW01
F101
T1A 250V
L101
ETQ-20K9A
C116
250V
0.047
C104
400V
2200P
C103
400V
2200P
C102
400V
2200P
C101
400V
2200P
L102
ETQ-20K12A
C117
400V
2200P
C118
400V
2200P
D101
S1WB60
AC
AC
C105
400V
22
C106
400V
22
C107
630V
2200P
D102
ERC2506
R101
330K
R102
330K
R103
330K
R104
330K
R105
330K
R106
330K
R107
330K
R108
330K
R109
330K
R110
330K
R111
5.6K
R112
5.6K
R113
5.6K
R114
5.6K
R115
5.6K
R116
5.6K
R117
5.6K
R118
5.6K
R119
5.6K
R120
5.6K
R121
5.6K
R122
5.6K
R123
5.6K
R124
5.6K
R125
5.6K
R126
5.6K
T101
ETS27K6B
Q101
2SC3353A
34.2
0.1
0
R130
470
Q102
2SA720
0.1
-0.1
-2.0
D103
MA161
C108
50V 0.22
R128
220
R127
100
F102
R131
8.2K
R132
1.0
R133
1.0
R134
1.0
R135
1.0
R136
33
C110
50V 0.01
IC101
AN6514
DRIVE
PWM
I/V
CONVERTER
BIAS
START/STOP
OSCILLATOR
OFF TIME
CONTROL
TIMER
HOLD
CURRENT
DETECTION
(2)
CURRENT
DETECTION
(1)
RESET SIGNAL
LOW VOLTAGE
DETECTION
1.6
1.6
0.7
5.5
11.0
3.1
1.2
2.7
R141
100
C115
25V 0.01
C113
16V22
ZD101
RD2.7EB
R142
10K
R138
12K
R137
15K
C111
50V
1000P
CR101
CR02AM4
R139
2.7K
PC101
ON3105
C112
25V
0.01
C109
25V
100
R140
15K
D104
ERA21-06
R129
4.7
C114
16V33
D105
ERA21-06
R143
4.7
D201
ERC35-02
L201
ETQ-6K1B
C203
25V
3300
R203
1.8K
R204
200K
C204
0.022
R201
820
8.3
0
0
IC201
AN6914
PD201
LN222RPH
13.6
0.2
0.1
0
0
R206
470
R209
22
R208
1.0K
R210
24K
R211
5.6

IMPORTANT SAFETY NOTIC
COMPONENTS IDENTIFIED BY THE
IMPORTANT FOR SAFETY WHEN R
THE SPECIFIED PARTS.

NOTE: THE MEASUREMENT M


T101 ⚠ ETS27K6B
R102 330K
R103 330K
R104 330K
R105 330K
R107 330K
R108 330K
R109 330K
R110 330K
R111 5.6K
R112 5.6K
R113 5.6K
R114 5.6K
R115 5.6K
R116 5.6K
R117 5.6K
R118 5.6K
R119 5.6K
R120 5.6K
R121 5.6K
R122 5.6K
R123 5.6K
R124 5.6K
R125 5.6K
R126 5.6K
06
PC101 ⚠ ON3105
D104 ERA21-06
R129 4.7
IC101 AN6514
0.7
5.5
11.0
3.9
3.1
1.2
2.7
I/V CONVERTER
BIAS
START/STOP
OSCILLATOR
OFF TIME CONTROL
HOLD
RESET SIGNAL
RENT ECTION (2)
CURRENT DETECTION (1)
LOW VOLTAGE DETECTION
C109 25V 100
C112 25V 0.01
R139 2.7K
R140 15K
R138 12K
R137 15K
C111 50V 1000P
CR101 CR02AM4
C113 16V22
C115 25V 0.01
ZD101 RD2.7EB
R142 10K
C114 16V33
D105 ERA21-06
R143 4.7
L201 ETQ-6K1B
D201 ERC35-02
C203 25V 3300
R203 1.8K
R204 200K
R201 820
PC101 ⚠ ON3105
C204 0.022
Q201 2SC637
8.3
R202 2.2K
TH201 1.4K
VR201 2K
CHARGE VOLTAGE
D202 MA161
C201 25V 4.7
D203 S2V10-2
R205 3.9K
C205 50V 0.022
R219 0.2
C202 25V 330
Q202 2SC1685
8.3
6.8
6.1
VR202 1K
OUTPUT VOLTAGE
ZD201 MA1062
R206 470
R207 3.9K
IC201 AN6914
PD201 LN222RPH
13.6
0.1
0.2
R209 22
R208 1.0K
R210 24K
R211 5.6
R212 5.6
R213 5.6
R214 5.6
R215 5.6
R216 5.6
R217 5.6
R218 5.6
⊕
⊖
V

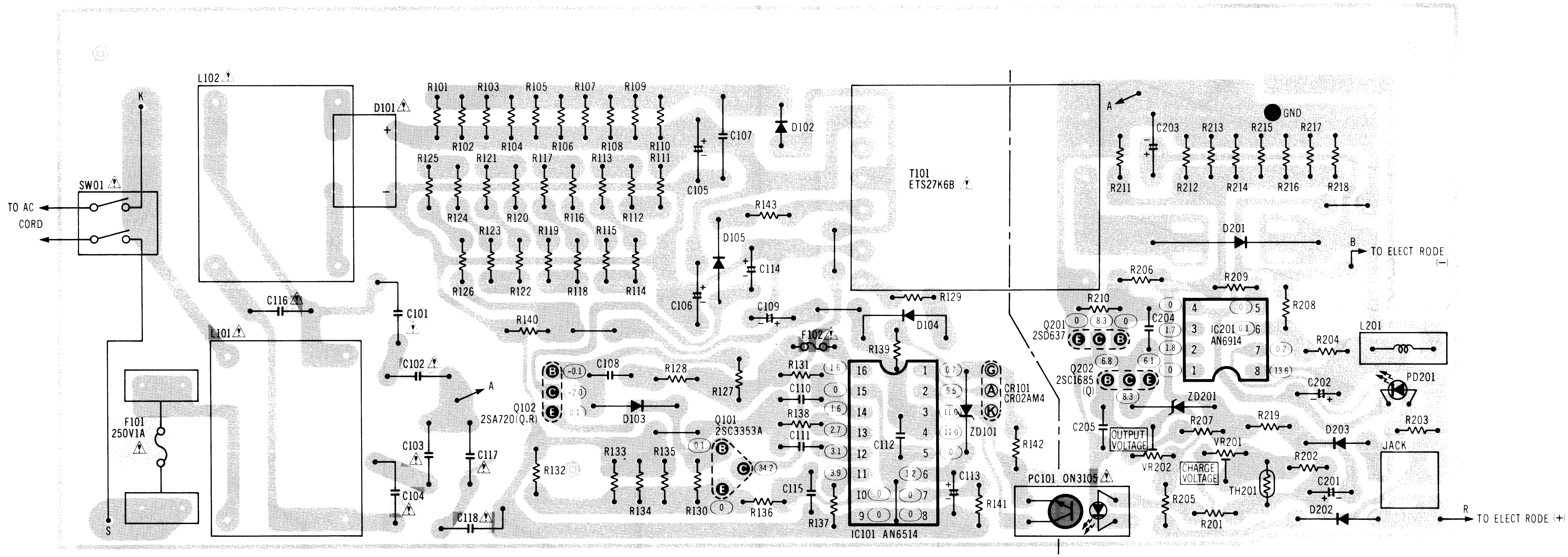
ICs & TRANSISTORs INFORMATION


E C B
2SD637
E C B
2SA720
2SC1685
B C E
2SC3353A
8 5 4 1
AN6914
16 9 8 1
AN6514

IMPORTANT SAFETY NOTICE:
COMPONENTS IDENTIFIED BY THE SIGN ⚠ HAVE SPECIAL CHARACTERISTICS IMPORTANT FOR SAFETY WHEN REPLACING ANY OF THESE COMPONENTS, USE ONLY THE SPECIFIED PARTS.

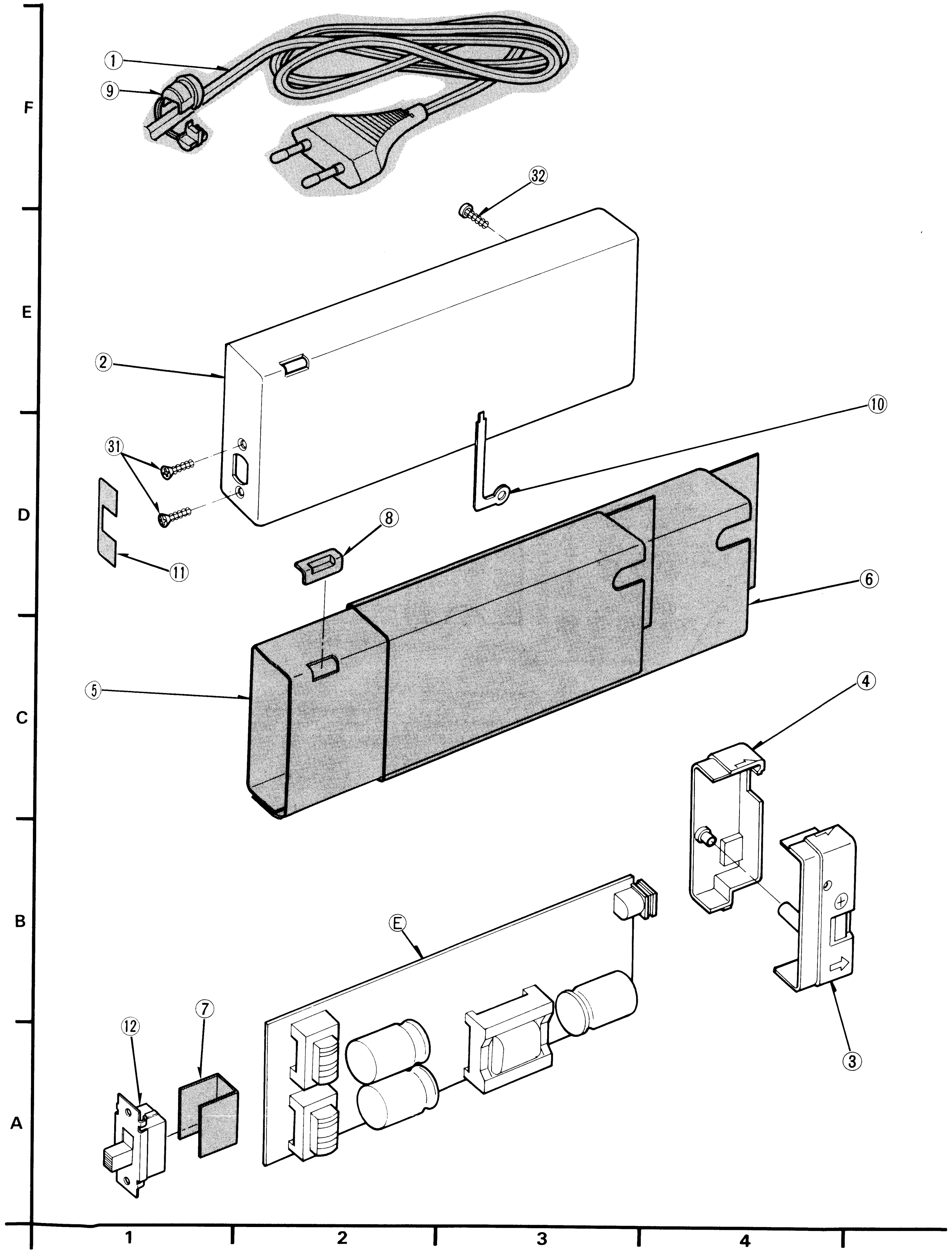
NOTE: THE MEASUREMENT MODE OF THE DC VOLTAGE ON THIS DIAGRAM IS DECK MODE.

4. CIRCUIT BOARD


TO AC CORD
SW01
K
S
F101 250V1A
L102
L101
D101
C116
C101
C102
C103
C104
C117
C118
R101
R102
R103
R104
R105
R106
R107
R108
R109
R110
R111
R112
R113
R114
R115
R116
R117
R118
R119
R120
R121
R122
R123
R124
R125
R126
C105
C106
C107
D102
D105
C114
R143
R140
R132
R133
R134
R135
R130
R136
R127
R128
C108
Q102 2SA720(Q,R)
D103
Q101 2SC3353A
A
C109
F102
R139
R129
D104
R131
C110
R138
C111
C115
R137
IC101 AN6514
C112
C113
R141
R142
CR101 CR02AM4
ZD101
T101 ETS27K6B
PC101 ON3105
Q201 2SD637
Q202 2SC1685 (Q)
C203
C204
C205
R206
R209
R210
R211
R212
R213
R214
R215
R216
R217
R218
GND
D201
B TO ELECT RODE (−)
IC201 AN6914
R208
R204
L201
PD201
ZD201
C202
R207
R219
VR201
VR202
OUTPUT VOLTAGE
CHARGE VOLTAGE
TH201
R205
R201
R202
R203
D203
C201
D202
JACK
R TO ELECT RODE (+)

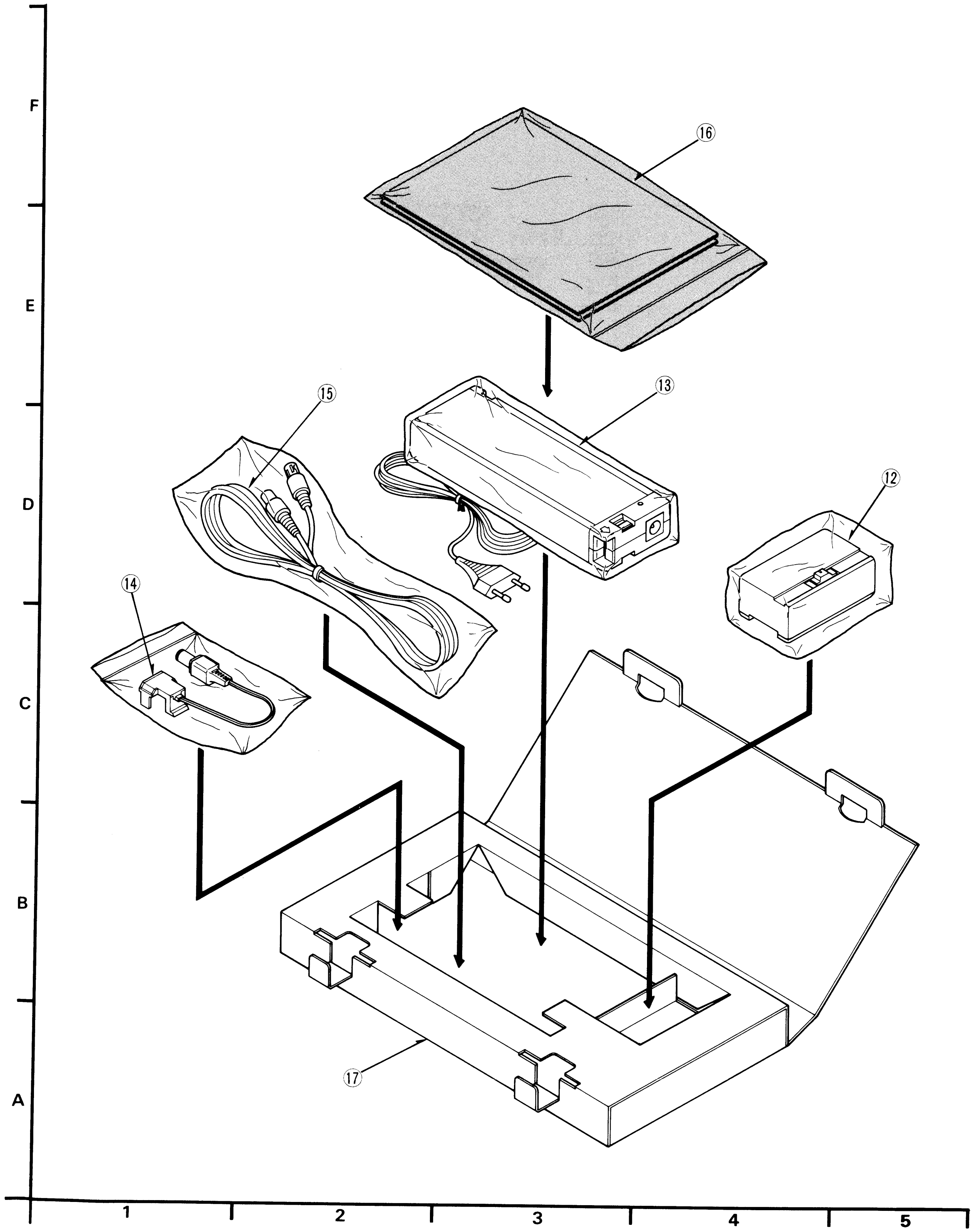
5. EXPLODED VIEWS

❶ CHASSIS & FRAME SECTION


F
E
D
C
B
A
①
⑨
㉜
②
⑩
㉛
⑪
⑧
⑥
⑤
④
Ⓔ
⑦
⑫
③
1
2
3
4

Back Page:
CIRCUIT BOARD

❷ PACKING PARTS SECTION


F
E
D
C
B
A
⑯
⑮
⑬
⑫
⑭
⑰
1
2
3
4
5

6. MECHANICAL REPLACEMENT PARTS LIST

Notes: 1. * Be sure to make your orders of replacement parts according to this list.
2. IMPORTANT SAFETY NOTICE
Components identified with the mark ⚠ have the special characteristics for safety. When replacing any of these components, use only the same type.

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
1(1)	VJA0111	AC Cord	1	VW-A11E ⚠
1(1)	VJA0112	AC Cord	1	VW-A11B ⚠
2(1)	VYK0776	Case Unit	1	VW-A11E
2(1)	VYK0775	Case Unit	1	VW-A11B
3(1)	VKM0295	Cover (A)	1	
4(1)	VKM0296	Cover (B)	1	
5(1)	VMZ0595	Insulator (C)	1	⚠
6(1)	VMZ0596	Insulator (D)	1	⚠
7(1)	VMZ0597	Insulator (E)	1	⚠
8(1)	VMZ0574	Insulator (B)	1	⚠
9(1)	VJF0017	Cord Bushing	1	⚠
10	VJR0116	Earth Angle	1	
11(1)	VQL1919	Switch Label	1	⚠
12(2)	ESE3553	Antenna Select Switch	1	
13(2)	XZB12X23C05	Polyethylene Bag	1	
14(2)	VJA0180	Battery Charging Cord	1	
15(2)	VJA0242	Antenna Cable	1	
16(2)	VQF1253	Fan Bag Kit	1	VW-A11E ⚠
16(2)	VQF1254	Fan Bag Kit	1	VW-A11B ⚠
17(2)	VPG1785	Packing Case	1	VW-A11E
17(2)	VPG1786	Packing Case	1	VW-A11B
		Screw		
31(1)	XSS3+5S		2	
32(1)	XTS3+16BFYJS		1	

7. ELECTRICAL REPLACEMENT PARTS LIST

Notes: 1. * Be sure to make your orders of replacement parts according to this list.
2. IMPORTANT SAFETY NOTICE
Components identified with the mark ⚠ have the special characteristics for safety. When replacing any of these components, use only the same type.
3. Unless otherwise specified,
All resistors are in OHMS (Ω), 1/4W ± 5% carbon. K=1,000Ω, M=1,000KΩ. All capacitors are in MICROFARADS (μF), ± 10% P=μμF.

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
	VEP21071A	Plug In AC Adaptor	1	
		P.C. Board Unit		
		Integrated Circuits		
IC101	AN6514		1	
IC201	AN6914		1	
		Transistors		
Q101	2SC3353A		1	⚠
Q102	2SA720		1	(Q,R)
Q201	2SD637		1	(Q)
Q202	2SC1685		1	(Q)
		Diodes		
D101	SIWB60	600V 0.6A	1	⚠
D102	ERC25-06	600V 1.2A	1	
D103	MA161	50V 0.1A	1	
D104,105	ERA21-06	600V 0.5A	2	
D201	ERC35-02	200V 2.5A	1	
D202	MA161	50V 0.1A	1	
D203	S2V10		1	
		Zener Diodes		
ZD101	RD2.7EB		1	
ZD201	MA1062		1	
		Photo Diode		
PD201	LN222RPH		1	
		Resistors		
R101-110	ERD25TLJ334	Chip 330K	10	
R111-126	ERD25TLJ562	Chip 5.6K	16	
R127	ERD25TLJ101	Chip 100	1	
R128	ERD25TLJ221	Chip 220	1	
R129	ERD25TLJ4R7	Chip 4.7	1	
R130	ERD25TLJ471	Chip 470	1	
R131	ERD25TLJ822	Chip 8.2K	1	
R132-135	ERD25TLJ1R0	Chip 1	4	
R136	ERD25TLJ330	Chip 33	1	
R137	ERD25TLJ153	Chip 15K	1	
R138	ERD25TLJ123	Chip 12K	1	
R139	ERD25TLJ272	Chip 2.7K	1	
R140	ERD25TLJ153	Chip 15K	1	
R141	ERD25TLJ101	Chip 100	1	
R142	ERD25TLJ103	Chip 10K	1	
R143	ERQ14LK4R7	Fuse 0.25W 4.7	1	
R201	ERD25TLJ821	Chip 820	1	
R202	ERD25TLJ222	Chip 2.2K	1	
R203	ERD25TLJ182	Chip 1.8K	1	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
R204	ERD25TLJ204	Chip 200K	1	
R205	ERD25TLJ392	Chip 3.9K	1	
R206	ERD25TLJ471	Chip 470	1	
R207	ERD25TLJ392	Chip 3.9K	1	
R208	ERD25TLJ102	Chip 1K	1	
R209	ERD25TLJ220	Chip 22	1	
R210	ERD25TLJ243	Chip 24K	1	
R211-218	ERD25TLJ5R6	Chip 5.6	8	
R219	ERQ14LKR20	Fuse 0.2	1	
		Variable Resistors		
VR201	EVN38CA00B23	2K	1	
VR202	EVN38CA00B13	1K	1	
		Capacitors		
C101-104	VCC0010	Ceramic 400V 2200P	4	⚠
C105,106	ECEA2GS220	Electrolytic 400V 22	2	
C107	ECQF6222KZ	Mylar 630V 2200P	1	
C108	VCF0023	Mylar 50V 0.022	1	
C109	ECEA1EU101	Electrolytic 25V 100	1	
C110	VCF0024	Mylar 50V 0.01	1	
C111	VCF0025	Mylar 50V 1000P	1	
C112	VCC0012	Ceramic(Chip) 25V 0.01	1	
C113	ECEA1CS220	Electrolytic 16V 22	1	
C114	ECEA1CG330S	Electrolytic 16V 33	1	
C115	VCC0012	Ceramic(Chip) 25V 0.01	1	
C116	ECQE2A473MW	Mylar 250V 0.047	1	
C117,118	VCC0010	Ceramic 400V 2200P	1	⚠
C201	ECEA1ES4R7	Electrolytic 25V 4.7	1	
C202	ECEA1EU331	Electrolytic 25V 330	1	
C203	ECEA1EU332	Electrolytic 25V 3300	1	
C204,205	VCF0023	Mylar 50V 0.022	2	
		Coils		
L101	ETQ20K9A	Cholk	1	⚠
L102	ETQ20K12A	Cholk	1	⚠
L201	ETQ6K1B	Cholk	1	
		Thyristor		
CR101	CR02AM4		1	
		Thermistor		
TH201	ERTD2FFL142S		1	
		Photo Coupler		
PC101	ON3105		1	
		Transformer		
T101	ETS27K6B		1	⚠
		Switch		
SW01	ESD3997		1	

Ref. No.	Part No.	Part Name & Description	Pcs / Set	Remarks
		Fuses		
F101	ET1A250V	1A 250V	1	⚠
F102	VSF0034	132°C 5A	1	⚠
		Miscellaneous		
	VJF0141	Fuse Holder	2	⚠
	VJJ0070	Jack	1	
	VSC0998	Heat Sink (A)	1	
	VSC1223	Heat Sink (B)	1	
	XSN3+10	Screw	1	for Q101
	XNG3	Nut	1	for Q101
	XWA3	Washer	1	for Q101
	VMZ0578	Insulator	1	
	VMA6497	F102 Hold Angle	1	

Panasonic

MATSUSHITA ELECTRIC

Printed in Japan